

JPRS 75256

5 March 1980

China Report

AGRICULTURE

No. 72



FOREIGN BROADCAST INFORMATION SERVICE

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I. GENERAL INFORMATION

CENTRAL METEOROLOGICAL BUREAU REPORTS COLD FRONT

OW300514 Beijing XINHUA Domestic Service in Chinese 1733 GMT 29 Jan 80 OW

[Text] Beijing, 29 Jan—According to news released by the Central Meteorological Bureau at 2300 on 29 January, a comparatively strong cold front from Mongolia is influencing most parts of our country. Areas affected by the cold front are universally experiencing strong winds, and low temperatures and sleet are reported in drought-stricken areas south of the Huanghe River.

At present the edges of this cold front have shifted to the southern and northwestern parts of our country. Affected by this cold front, areas in the southern part of northeast China, north China, the Huanghe and Huaihe areas; areas south of the Changjiang River, south China and the eastern part of southwest China have experienced northerly winds between grade 5 and grade 7 in force; winds between grade 7 and grade 8 in force have appeared over Bohai and the northern part of the Yellow Sea. The temperature in north China and the Huanghe and the Huaihe areas has dropped from 4 to 10 degrees. Rains and snow measuring from 3 to 15 millimeters are reported over the eastern part of northwest China, the Wei River Valley and most parts of the Huanghe and Huaihe river basin, the Changjiang and Huaihe river basin, the middle and lower reaches of the Changjiang River, south of the Changjiang River and south China, thereby providing relief from the drought in the Changjiang and Huaihe areas and in areas south of the Changjiang River. It is expected that the cold front will continue to move in a southeasterly direction. Northerly winds from grade 5 to grade 7 in force are expected to remain in most parts of north China, the eastern part of northwest China, the eastern part of southwest China, the Huanghe-Huaihe and the Changjiang-Huaihe areas, areas south of the Changjiang River and south China between the night of 29 January and 1 February; northerly winds between grade 7 and grade 9 in force are expected over Bohai, the Yellow Sea, the East China Sea, the Taiwan Strait, the northern part of the South China Sea and Beibu Wan; a drop in temperature from 8 to 12 degrees is expected in most areas in south China, the eastern part of southwest China and areas south of the Huanghe River; a drop in temperature from 6 to 10 degrees is also expected in the eastern part of southwest China. Rains and snow

are expected over the Changjiang-Huaihe areas, areas south of the Changjiang River, south China and southwest China; in addition, frost is expected in the central part of south China and areas to the north. Efforts should be made to do cold prevention work well.

CSO: 4007

VIGOROUS DEVELOPMENT OF AGRICULTURAL ENGINEERING STRESSED

Guangzhou NANFANG RIBAO in Chinese 5 Jan 80 p 3

[Article by Tao Dinglai [7118 7844 0171], vice president of the Chinese Academy of Agricultural Science: "Vigorously Develop Agricultural Engineering Research"]

[Text] The history of agricultural production by mankind is more than several thousand years old. With the development of production techniques and the accumulation of a large volume of experience, an agricultural science rich in content has been formed. Many kinds of crops, domestic animals, and fowl today no longer resemble what they used to look like in their original natural state. They are the results of selective cultivation and breeding carried out by mankind over an extended period of time in order to satisfy his needs. Even the soil of the farmland today is no longer natural geological soil but one which was gradually formed by mankind through many years of cultivation, irrigation, fertilization, and growing of crops. Biology, including zoology, botany, microbiology, entomology, and genetics, together with pedology and meteorology, constitute the foundation of modern agricultural science. With the aid of these basic sciences, mankind has achieved over the years a significant development in agricultural production and agricultural science, which in turn has enriched and promoted the development of the related basic sciences.

The engineering technology required for agricultural production is many-sided. Knowledge of only one certain aspect is insufficient. The subject of agricultural engineering combines all the related engineering technologies in order to satisfy the needs of agricultural production. For example, agricultural mechanization is one of the most important aspects of agricultural engineering. Tractors and agricultural machinery must interact with the soil and the crops. They must be able to meet the needs and adapt to the local agricultural techniques. Therefore, an ordinary mechanical engineer cannot successfully perform the tasks of designing agricultural machinery. Furthermore, the demands made by agriculture are often many-sided and cannot be satisfied by machinery alone. Take the work related to reclamation of land and construction of fields, for example.

It is necessary not only to clear the land and plow it deep but also to construct ditches for drainage as well as irrigation; in other words, to implement a rational field plan. As for the design of an irrigation system, especially a system involving modern spray or drip irrigation techniques, first of all the amount of water required by the crops must be understood. Then the fields and ditches must be designed in accordance with the available sources of water and the equipment involved in order to be able to get the maximum effect from the irrigation system.

In its early stage of development, so-called agricultural engineering was only the application to agricultural operations of the techniques developed by the various sciences. There was no research which explored deep to the core of problem based on the characteristics of agriculture, nor was any theory of agricultural engineering formulated. Very significant changes in the situation have taken place in the past decade or so as a result of the progress in science and technology and production techniques. Agricultural engineering has enjoyed significant development in both depth and breadth.

Speaking of depth, agricultural engineering today has already developed into a technological science which combines modern biology and engineering. To improve the environment in which agricultural crops grow, those factors which are considered to affect the growth of plants, such as temperature, humidity, sunlight, and the oxygen or carbon dioxide content of the atmosphere, are being studied energetically. The effects of soil on growth—including such factors as soil structure and firmness, moisture, fertilizer, gas and the heat content of the soil—are also being studied carefully. The scientific research personnel of agricultural engineering have already broadened the domain of their research activity to include plant pathology in order to be able to control these environmental factors. For example, the law of mechanics governing the growth of the root system is one of the subjects of agricultural engineering research. Since agricultural engineering research is capable of providing the necessary environmental conditions for the growth of agricultural crops, Xihong persimmon cultivated in greenhouses can, on average, yield 20,000 jin per mou, reaching a maximum of more than 30,000 jin per mou. It is the same in the raising of fowl. Take the factory-type chicken farm, for example. Many engineering and technological problems such as environmental control and feed preparation must be solved. The study of these problems is inseparable from the studies of the law of growth, nutrition, and physiology of chickens and the formation of eggs. Chicken meat has become very cheap in those countries, such as England and Japan, where factory-type chicken farms have been put into operation. Those countries, where the population is large and the amount of arable land is small, used to import chicken meat and eggs. Today, they are not only self-sufficient but also capable of exporting the excess.

Speaking of breadth, agricultural engineering today is no longer limited to the four subjects of decades ago. The greenhouse cultivation and factory-type chicken farms referred to above contain the results of modern

agricultural engineering research. Application of electronics to agricultural production enabled automatic control and automation of various agricultural production processes. Introduction of electronics technology and electronic computers into the domain of agricultural engineering has further expanded the range of applicability of various engineering techniques to agriculture. For example, electronics technology has made it possible to distinguish one cow from another and give different feed formulas according to the milk-yielding ability of each individual cow, thus realizing automated feeding and milking. Application of electronic computer technology and systems engineering has further quantified the problems concerning farm management, which heretofore had to rely solely on experience, enabling optimization of the process by computer. The appearance of artificial satellites has provided us with an excellent means for observing the natural world on the earth's surface. The appearance of remote sensing technology has further provided mankind with a new method of observing and understanding the objective phenomena of the natural world. Today, remote sensing technology has been successfully applied to agriculture. It is capable of accurately assessing the damage caused by drought, flood, and insects, or of predicting crop yields. This is especially significant for the implementation of anti-disaster or disaster-preventive measures on a very large piece of land.

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CSO: 4007

EXPERIMENTS CONDUCTED TO MODERNIZE ANIMAL HUSBANDRY

OW290138 Beijing XINHUA Domestic Service in Chinese 0343 GMT 27 Jan 80 OW

[Excerpts] Beijing, 27 Jan—To explore ways for modernizing animal husbandry in China's pastoral areas, the Ministry of Agriculture, in coordination with the provinces and autonomous regions concerned, established 18 experimental points for modernizing pastoral areas in 9 provinces and autonomous regions in 1979. After a year's work, these experimental points have made some gratifying initial achievements.

These experimental points can be classified into four groups according to their conditions and tasks:

1. Experimental points for modernizing grassland include Dorbod Mongol Autonomous County in Heilongjiang and Guyuan County of Hebei.
2. Comprehensive experimental points for modernizing animal husbandry include Xianghuang Banner, Zhengxiangbai Banner, Uxin Banner and Autonomous Banner of Evenki Nationality in Nei Monggol Autonomous Region; Serxu County of Sichuan; Kinyuan County of Xinjiang Uygur Autonomous Region; Zekog County and Haiyan County of Qinghai; Xiahe County of Gansu; and Yanchi County of Ningxia Hui Autonomous Region.
3. Experimental points for joint enterprises for animal husbandry, industry and commerce include Zoige County in Sichuan; Barin Right Banner and Horqin Right Wing Front Banner of Nei Monggol; and Fuyun County in Xinjiang.
4. Experimental points for conducting projects with external aid include a model farm in Ongniud Banner in Inner Monggol and Nanshan model farm in Chengbu Miao Autonomous County in Hunan.

Some capital construction projects are now still underway at these experimental points. In 1979 alone, these experimental points completed building a total area of some 2.4 million mu of pasture land enclosed with barbed wire, pasture land artificially planted and pasture land improved through resowing; cultivated 45,000 mu of seed plots; afforested

69,000 mu of land; and increased irrigated area in pasture land by 1.12 million mu through digging wells and repairing ditches.

Experiments conducted at these 18 points in the past year or so indicate that to carry out modernization of animal husbandry in pastoral areas at localities with relatively favorable natural conditions, it is necessary to concentrate on building capital construction projects in grassland, carry out comprehensive construction projects, and vigorously improve management and administration as well as promote scientific livestock breeding.

CSO: 4007

INITIAL STUDY OF ALLELIC RELATIONSHIPS OF DWARF GENES IN RICE

Beijing YICHUAN [HEREDITAS] in Chinese No 6, Nov 79 pp 10-13

[Article by Gu Minghong [7357 6900 3163] of the Jiangsu Agricultural College in Yangzhou, and Zhu Lihong [2612 4539 1347] of the Nanjing Agricultural College]

[Text] Beginning in the latter part of the 1950s, a series of important achievements were made in the cultivation of stunted varieties of xian rice in the southern rice regions of our nation. This is significant in pushing forward our nation's rapid development in paddy rice production and in enriching the theory of cultivation of varieties by paddy rice genetics.

Beginning in 1965, the International Rice Research Institute (IRRI) in the Philippines also successively cultivated a group of short stemmed and high yielding paddy rice varieties. Since then, cultivation of stunted varieties has become a major direction of research in the work of cultivating paddy rice varieties in each of the Southeast Asian and South Asian nations. The concept of "cultivation of varieties by plant type" developed upon this foundation has attracted wide attention in our nation.

Nanism as a form of variation in paddy rice can frequently occur and especially in induced variations during the cultivation of varieties. But in the practice of cultivation of varieties, not all nanism as a form of variation have a good useful value. This has been proven by the experience of many units. Studies indicate the dwarf stemmed material being used in cultivation of varieties at present all belong to semi-dwarf types. Their plant height is generally between 80 and 200 centimeters^(1,4). Genetically, it is generally controlled by a single gene carrying a recessive character of primary effect^(1,2,4,6).

Analysis shows that the dwarf stemmed xian paddy rice varieties propagated in our nation originate mainly from the varieties ai zi zhan and ai jiao nan te^(1,3), while dwarf stemmed xian rice varieties of Southeast Asia and South Asia originate mostly from the varieties de jiao wu jian, tai zhong ben di No 1 and ai jiao zi of our nation's Taiwan province⁽⁷⁾. The parents of all these dwarf stemmed varieties belong to the semi-dwarf type material mentioned above.

Regardless of how great an achievement has been made by these dwarf stemmed sources in the cultivation of stunted rice varieties, a profound understanding of the genetics of the mutual relationship among these dwarf stemmed sources is still lacking at present. In 1974 we began to study the allelic relationships of the genes of these dwarf stemmed sources. Partial results and preliminary analysis obtained are described as follows.

Material and Method

This study used several major dwarf stemmed xian rice varieties commonly seen domestically and abroad and one hybrid material (Table 1). Among them, the xiang yang ai, zhao yang ai No 13 and gui yang ai No 1 were all supplied by Mr Huang Yaoxiang [7806 5069 4382] of the Grain and Food Crops Research Institute of the Guangdong Provincial Agricultural Science Academy. The origin of their dwarf stemmed gene of Nanjing No 11 and guang lu ai No 4 is the ai zi zhan. The origin of the dwarf stemmed gene of zhai ye qing is the Indonesian variety hua long shui tian gu. The origin of the dwarf stemmed gene of IR24 and IR28 is the di jiao wu jian.

Hybridization was conducted in 1974. Between 1975 and 1977, the F_1 and F_2 of each combination and the F_3 of each individual combination were planted. Hybrids of each generation were planted singly. The plant heights were actually measured and recorded during the period of maturation.

Among the studied materials, the xiang yang ai, zhao yang ai No 13 and the gui yang ai No 1 were all late xian types of southern China and they could not head normally under normal conditions in Yangzhou. Therefore the plant heights of these three varieties were measured after heading under artificial short daylight treatment. The length of such treatment lasted 9 days and the daily period of light shine was 9 hours. Perhaps because of the same causes, the heading time of the F_1 of hybrid combinations 1,2,3 was visibly late and the plant height was obviously too tall. Heading periods of F_2 showed clear separation and nearly half of the plants could not head normally under normal sun light conditions. To avoid overly late heading to affect the plant height, the height of the plants was measured once on 30 August and all plants that did not head were not measured.

Results and Analysis

The plant height and heading time of F_1 of six hybrid combinations are shown in Table 2. It can be seen that the plant heights of F_1 of all combinations are taller than both parents. The plant height of combinations 1,2, and 3 is outstanding. Among them, the F_1 plant of gui yang ai No 1 X Nanjing No 11 is the tallest, taller than the tallest parent by 52.3 centimeters. The combination zhao yang ai No 13 X Nanjing No 11 follows and is taller than the tallest parent by 38.8 centimeters. The plant height of the F_1 plant of xiang yang ai X Nanjing No 11 is taller than the tallest parent by 27 centimeters. The plant heights of the F_1 plants of these three combinations are visibly taller than their tallest parents because of the effect of their sensitivity to light, and their genetic cause can be reflected by the separation in the F_2 generation.

Table 1 Hybrid Combinations and Origin of Parents

| Generation | Hybrid Combinations | | Origin of Parents | |
|------------|---|---|--|--|
| | Combination | Female | Male | |
| 1 | xiang yang ai X Nanjing No 11 | xiang yang ai (awaiting investigation) | Nanjing No 11 (Nanjing No 6 C er jiu ai No 4) | |
| 2 | zhao yang ai No 13 X Nanjing No 11 | zhao yang ai No 13 (selected from zhao yang ai) | Nanjing No 11 (Nanjing No 6 X er jiu ai No 4) | |
| 3 | gui yang zi No 1 X Nanjing No 11 | gui yang ai No 1 (long yang zi X early and late hybrid varieties of F ₃) | Nanjing No 11 (Nanjing No 6 X er jiu ai No 4) | |
| 4 | IR24 X guang lu ai No 4 | IR24 (IR8 X IR127-2-2) | Guang lu ai No 4 (Guang chang ai 3784 X lu cai hao) | |
| 5 | Nanjing No 11 X zhai ye qing | Nanjing No 11 (Nanjing No 6 X er jiu ai No 4) | Zhai ye qing (hua ling shui tian gu X tang zhu) F ₃ X ji dui lun) | |
| 6 | zhai ye qing X (IR8 zhen zhu ai) F ₂ | Zhai ye qing (hua long shui tian gu X tang zhu) F ₃ F ₃ X ji dui lun) | IR8 X zhen zhu ai | |

Table 2 Variations of Plant Height of the F₁ Generation

| Combination Number | Combinations | Time heading begins (month/day) | Height of female plant (cm) | Height of male plant (cm) | Height of F ₁ plant (cm) | Height of F ₁ -height of tallest parent (cm) |
|--------------------|---|---------------------------------|-----------------------------|---------------------------|-------------------------------------|---|
| 1 | xiang yang ai X Nanjing No 11 | 9/19 | 73.0 | 93.0 | 120.0 | 27.0 |
| 2 | xiang yang ai No 13 X Nanjing No 11 | 9/28 | 83.0 | 93.0 | 131.8 | 38.8 |
| 3 | gui yang ai No 1 X Nanjing No 11 | 10/1 | 69.0 | 93.0 | 145.3 | 52.3 |
| 4 | IR24 X guang lu ai No 4 | 8/12 | 95.0 | 80.1 | 101.6 | 6.6 |
| 5 | Nanjing No 11 X Zhai ye qing | 7/29 | 93.0 | 97.0 | 100.6 | 3.6 |
| 6 | Zhai ye qing X (IR8 X zhen zhu ai) F ₂ | 7/27 | 97.0 | / | 100.1 | / |

The results of investigation of the separation of each hybrid combinations of the F_2 generation are shown in Table 3. It can be seen from Table 3 that the plant heights of the six combinations visibly separate into two categories. Combinations 1,2,4,5 and 6 belong to one category and combination 3 belongs to another category. The separation of plant heights of the former manifests a single peak distribution, and the height of the majority of single plants is similar to that of the tall parent (Diagrams 1,2).

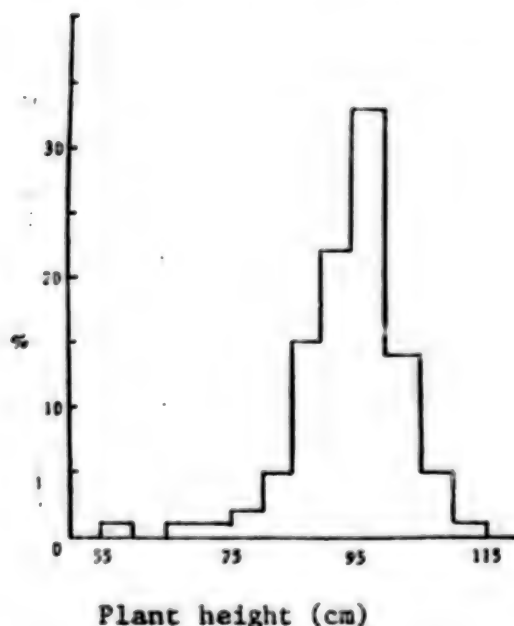


Diagram 1 Distribution of plant heights of (IR24 X guang lu ai No 4) F_2 plants

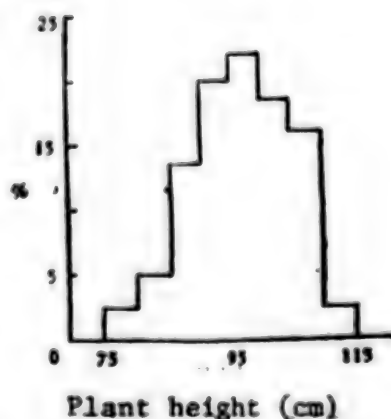


Diagram 2 Distribution of plants heights of (xiang yang ai X Nanjing No 11) F_2 plants

For example, in IR24 X guang lu ai No 4, IR24 is the taller parent. Its plant height is 95 centimeters. The plant height of most of the single F_2 plants are between 85.1 centimeters and 105.0 centimeters, constituting 84 percent. Most of the heights concentrate within the range between 95.1 centimeters and 100.0 centimeters. Of the combination xiang yang ai X Nanjing No 11, Nanjing No 11 is the taller parent with a plant height of 93 centimeters. Most of its single F_2 plants are between 85.1 centimeters and 110.0 centimeters tall, constituting 90.1 percent. Most of the heights concentrate within the range between 95.1 centimeters and 110.0 centimeters. Separation trends of these combinations are manifested by the following: (1) large degree of separation; (2) multiple peak distribution (Diagram 3), where it can be seen from Table 3 that distribution peaks appear in the three ranges 45.1-55.0 centimeters, 90.1-100.0 centimeters and 120.0-130.0 centimeters; (3) separation surpassing the parents is clearly manifested with a few dwarfed by the parents and the majority surpassing the parents in height, among them the shortest single plant was only 42 centimeters tall and the tallest single plant reached 170 centimeters, height of the latter being four times that of the former. Manifestations of the F_3 generation show the dwarf plants and the extremely short plants tend to be stable (Table 3).

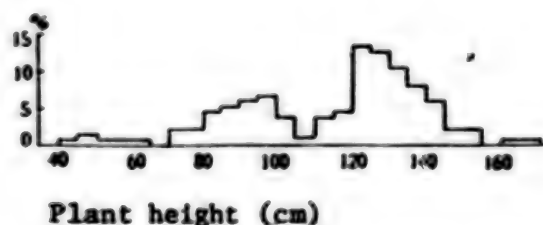


Diagram 3 Distribution of plant heights of (gui yang ai No 1 X Nanjing No 11) F_2 plants

It can be determined from the separation characteristics of the F_2 generation that the variation in height of plants of the combinations 1,2,4,5 and 6 is controlled mainly by one dwarf stemmed gene of primary effect, and each of the dwarf stemmed gene of primary effect of the parents of each combination is an allele of the other. Combination 6 contains three dwarf stemmed varieties, separately representing the three dwarf stemmed sources of the hua long shui tian gu, di jiao wu jian and ai zi zhan. The characteristics of height variations of plants of the offspring generations of multiple cross indicate that the dwarf stemmed genes of primary effect of these three dwarf stemmed sources are allelic. Verification of these by combinations 4 and 5 gives an even clearer indication of their allelic relationship.

Table 3 F₂, F₃ plants

| 1) 组合代号 | 2) 组 合 | 3) 世代 | 4) 株 高 | | | | | | | | | |
|---------|-------------------------------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | | 40.1 45.0 | 45.1 50.0 | 50.1 55.0 | 55.1 60.0 | 60.1 65.0 | 65.1 70.0 | 70.1 75.0 | 75.1 80.1 | 80.1 85.0 | 85.1 90.0 |
| 1 | 6) 向阳矮 × 南京 11 号 | F ₁ | | | | | | | | 2.5 | 4.9 | 13.6 |
| 2 | 7) 加阳矮 13 号 × 南京 11 号 | F ₁ | | | | | | | | | 1.3 | 1.3 |
| 3 | 8) 桂阳矮 1 号 × 南京 11 号 | F ₁ | 0.7 | 1.5 | 0.7 | 0.7 | 0.7 | | 2.2 | 2.2 | 4.4 | 5.2 |
| | | F ₂ | | | | | | | | | 50.0 | 37.5 |
| | | F ₃ | | 7.0 | 66.7 | 23.3 | 3.0 | | | | | |
| 4 | 9) IR24 × 广陆矮 4 号 | F ₁ | | | | 1.0 | | 1.0 | 1.0 | 2.0 | 5.0 | 15.0 |
| 5 | 南京 11 号 × 窄叶青 10) | | | | | | | | | | 4.0 | 11.0 |
| 6 | 窄叶青 × (IR8 × 珍珠矮) F ₁ 11 | | | | | | | | 2.0 | | 5.0 | 17.0 |

Key:

1. Combination numbers
2. Combinations
3. Generation
4. Plant height
5. High frequency distribution classification (centimeters)
6. xiang yang ai X Nanjing No 11
7. zhao yang ai No 13 X Nanjing No 11
8. gui yang ai No 1 X Nanjing No 11
9. IR24 X guang lu ai No 4
10. Nanjing No 11 X zhai ye qing
11. zhai ye qing X (IR8 X zhen zhu ai) F₂

The variation of plant height of the F₁ plants of combinations 1 and 2 tends to be high. It is very possible that this is mainly because of the effect of genes which react sensitively to the length of exposure to light. The other varieties are less sensitive to the length of exposure to light. Thus variation of plant height of F₁ is basically similar to that of the parents. It can be determined from this that the dwarf stemmed genes of primary effect of each pair of parents of each combination 1, 2, 4, 5 and 6 are all mutually allelic.

Contrary to the situation of the above combinations, separation characteristics of combination 3 indicate that the dwarf stemmed genes of primary effect carried by the two varieties gui yang ai No 1 and Nanjing No 11 are not allelic. It can be concluded from the above analysis that the relationships between the dwarf stemmed genes of primary effect of gui yang ai No 1 and di jiao wu jian are not allelic.

分 数 (厘米) 5)

| | | | | | | | | | | | | | | | |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 90.1 | 95.1 | 100.1 | 105.1 | 110.1 | 115.1 | 120.1 | 125.1 | 130.1 | 135.1 | 140.1 | 145.1 | 150.1 | 155.1 | 160.1 | 165.1 |
| 95.0 | 100.0 | 105.0 | 110.0 | 115.0 | 120.0 | 125.0 | 130.0 | 135.0 | 140.0 | 145.0 | 150.0 | 155.0 | 160.0 | 165.0 | 170.0 |
| 20.0 | 22.0 | 18.5 | 16.0 | 2.5 | | | | | | | | | | | |
| 3.6 | 7.8 | 22.0 | 19.5 | 16.9 | 14.3 | 9.1 | 4.0 | | 1.3 | | | | | | |
| 5.9 | 6.7 | 3.7 | 0.7 | 3.7 | 4.4 | 13.3 | 12.6 | 10.4 | 8.2 | 6.0 | 2.2 | 2.2 | | 0.7 | 0.7 |
| 12.5 | | | | | | | | | | | | | | | |
| 22.0 | 33.0 | 14.0 | 5.0 | 1.0 | | | | | | | | | | | |
| 32.0 | 40.0 | 13.0 | | | | | | | | | | | | | |
| 11.0 | 21.0 | 21.0 | 24.0 | 12.0 | 7.0 | 1.0 | | | | | | | | | |

Brief Conclusion and Discussion

Preliminary indications of the study show the dwarf stemmed genes of primary effect of xiang yang ai and zhao yang ai No 13 are mutually allelic while gui yang ai No 1 is controlled by one or more genes which are not allelic. The three varieties are all late xian which are strongly sensitive to light, and under natural conditions in Yangzhou they cannot head normally. The experiment was conducted under natural conditions and thus the effect of sensitivity to light upon plant height was not eliminated. The performance of the dwarf stemmed genes of primary effect of these varieties have been limited to a certain extent.

The plant type of the gui yang ai No 1 is clustered. The leaves are erect. The color of the leaf is dark. The tillering strength is strong. It is one of the materials labeled by Huang Yaoxiang of the Guangdong Provincial Agricultural Science Academy as a bushy and fast growing type. Especially short types can separate from its hybrid offspring generations. The utilization value of this dwarf source in cultivation of varieties is worth further studies.

The dwarf sources of IR24, guang lu ai No 4 and zhai ye qing are respectively di jiao wu jian, ai zhan and hua long shui tian gu, and their dwarf stemmed genes of primary effect are mutually allelic. The dwarf stemmed genes of Nanjing No 11 and guang lu ai No 4 are of the same source. The effects of the dwarf stemmed genes of primary effect of these xian rice varieties may be multiple effects which affect changes in morphological, physiological and various other characteristics comprehensively. For example, varieties originating from the di jiao wu jian manifest a tall and straight plant type and the morphological distribution of the stem and leaves is good. Varieties originating from the hua long shui tian gu have a loose and scattered plant type, their base internodes are long, and often their

nodes are exposed and their resistance to lodging is weak. Most of the varieties originating from ai zi zhan mostly possess characteristics between the two above. But, these allelic dwarf stemmed genes have all achieved good results in cultivation of hybrid varieties. Good achievements have been made in paddy rice heterosis in our nation's south as a result of the logical utilization of dwarf stemmed allelic genes of varieties of different ecological types.

This study has discovered that although most of the varieties used were controlled by a single dwarf stemmed recessive gene of primary effect, allelic genes of different origins often emerge to a certain degree in hybrid generations as superior variations. This may very possibly be due to the effect of different modifying genes of minute effect accompanying different allelic dwarf stemmed genes. For example, when dwarf stemmed varieties originating from di jiao wu jian are used in hybridization, F_2 plants that are taller than the parents often appear. In addition, when varieties that are strongly sensitive to light participate in the hybridization under natural conditions, the effect of the dwarf stemmed genes of primary effect will be overshadowed by the light sensitive genes and the hybrids will tend to grow tall. Thus when using this type of material, the effect of sensitivity to light should be eliminated in the method of study.

Studies of selective cultivation of dwarf stemmed varieties and surplus yields of paddy rice at home and abroad show that selecting and using good dwarf sources affect the success of cultivating varieties greatly. Although our nation has had a rich experience of success in utilizing the major dwarf sources of xian rice, ai zi zhan and ai jian nan te hao in cultivation of hybrid varieties, the result of using them over and over again has led to a narrow kinship and progress in cultivation of varieties has been slow. For this, to continue to discover good allelic dwarf sources and dwarf sources which are not allelic has become an important topic in the cultivation of dwarf stemmed varieties of surplus yielding paddy rice at present. The relationship among the origins of the known dwarf stemmed genes of primary effect of xian also awaits further exploration.

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9296

CSO: 4007

CHINESE SCIENTISTS PRODUCE NEW SEED STRAIN

OW191240 Beijing XINHUA in English 1222 GMT 19 Feb 80 OW

[Text] Beijing, 19 Feb (XINHUA)--A hardy strain of rice that is immune to the disease rice-blast is being grown on a total of 13,000 hectares of land in Liaoning Province, Northeast China, Henan Province, Central China, and in Beijing.

The Chinese Academy of Agricultural Sciences also bred other hardy, high-yield plants last year from 2,000 specimens of cultivated rice, wild rice, wheat, beans and other vegetables collected in a survey of crop resources along the Yellow River and in Yunnan, Guangdong and Guangxi in southern China.

Experimental farming with a cross-bred non-glutinous rice in Beijing, Hebei, Shaanxi and Henan has already showed a 20 percent rise in yield.

Last year the scientists worked out a plan to reclaim the alkaline land in the Haihe, Huaihe and Yellow River basins. They charted zones suitable for stockbreeding, and for growing grain, cotton, oil-bearing crops, sugar, beetroot, tea, fruit and silkworms.

The scientists introduced an antibiotic effective against striped canker in rubber trees and cured a number of silkworm virus diseases.

They worked out several simple methods of diagnosing pig and chicken diseases and made 6,000 feed formulas for the animals. They also made new breakthroughs in the diagnosis of horse anaemia and the immunization of horses.

Other research achievements included the use of radiation in seed breeding and the identification of fertilizers' effects by using trace reagents.

CSO: 4020

FOSHAN CITY ACHIEVES UNPRECEDENTED SUCCESS IN PIGSKINS

Eating of Pigskins Discouraged

Guangzhou NANFANG RIBAO in Chinese 14 Jan 80 p 2

[Text] Pigskins can be eaten and can be used. Should they be eaten, or should they be used? From the viewpoint of economic value, using is better than eating. The related department of our province had made a calculation. For one million sheets of pigskins, if 350,000 sheets are used to make leather shoes, 100,000 sheets to make leather belts, 50,000 sheets to make wallets, 300,000 sheets to make gloves and 200,000 sheets to be exported, the total production value can reach 22.5 million yuan. But if they are eaten, with each sheet weighing ten catties and each catty to be worth one yuan, they are worth at most ten million yuan. Also, in producing one million sheets of pig leathers and having them processed into leather goods, 2,200 persons will get jobs. In addition, the nutrition value of pigskin is not high and it is not liked by most people, thus wasting industrial material and adding to the burden of consumers. Therefore, pig skinning is beneficial to the nation and also to the individuals. Why don't we do it?

Pig slaughtering in our province takes the fourth place in our nation, and pig skinning gives a very high potential. But not enough emphasis was placed on pig skinning, and leather supply was inadequate in the past. As a result, tanneries and leather goods plants did not run at full capacity, supply of leather shoes and leather goods was tight, industrial and agricultural leather parts were in short supply, and export programs could not be fulfilled in the past several years. Immediate action should be taken to correct this situation.

From the experience of Foshan City, in order to have pig skinning well done, it is necessary to emphasize thinking, measures which will help us catch up and sound policies. Awards should be made to those who have done the most and the best pig skinning and who have overfulfilled their pig skinning quotas. It is a good time for pig slaughtering before and after the spring festival. It is expected that this opportune moment will be taken advantage of to get more pigs skinned so as to strive for more development in our province's pig skinning this year, thus catching up with the pace of the whole nation.

Pigskins Foreign Exchange Value

Guangzhou NANFANG RIBAO in Chinese 14 Jan 80 p 2

[Article by Hai Hai [3189 3189]]

[Text] 10,000 sheets of pigskin used for making leather overcoats for export will earn \$72,000; for making leather shoes for export will earn \$96,000; for making leather belts for export will earn \$105,000; for making leather balls for export will earn \$130,000.

Double-layered leather recovered from 10,000 sheets of pigskins used for making work gloves for export will earn \$6,000.

Wastes and scraps from 10,000 sheets of pigskins used for making gelatin for export will earn \$6,000.

Finished goods from 10,000 sheets of pigskins for export will on an average earn about \$100,000 which can be exchanged for 250 tons of steel products, 500 tons of chemical fertilizers, 700 tons of wheat, 250 tons of soybeans or 12 automobiles, respectively.

Pigskin Output Unprecedented

Guangzhou NANFANG RIBAO in Chinese 14 Jan 80 p 2

[Article by Chen Yang [7115 2799], practice reporter of Zhongshan University]

[Text] Significantly different results before and after pig skinning undertaken by the Foshan City Foodstuffs Corporation in the last year indicate that the source of leathers will be expanded to provide sufficient raw materials for developing light industry if enough attention is paid by the management and measures are adequately taken. The corporation got 21,712 sheets of pigskins in September and October of the last year, increased more than 25 times compared with that from January to August, and overfulfilled the yearly quota by more than 63% by the end of November. Their course of action was highly praised at the Provincial Pig Skinning Work Conference recently held jointly by industry and commerce.

Foshan City is an industrial city and also an appointed tourist region, with the urban population growing so rapidly and travellers visiting so frequently that there is a constant, great need for pigs. Previously, certain comrades in the Foshan City Foodstuffs Corporation in stressing the controversy between meat and skin, once relaxed the work of pig skinning. Therefore, quotas for pig skinning have never been fulfilled in recent years. After a joint notice for related problems concerning developing the pigskin tannery industry by vigorously doing the pig skinning was issued by the central Ministry of Light Industry, the Ministry of Commerce and the Ministry of Finance at the end of August in the last year, they have conducted study sessions and

discussions. They have come to recognize that although the fact that pig skinning was not well done in these years is because of the inadequate supply of pigs, their is not enough understanding of the importance of pig skinning. By regarding it not as an important matter, is also of great concern. After understanding grew through study and discussions, they have regarded pig skinning as one of the important assignments to the Corporation, with one business manager personally taking charge of the matter. In addition to having the slaughter houses take firm control of their job, the pig skinning assignment is also allocated steadily to meat sales departments and food stations. The progress in pig skinning is also regularly checked, correcting the previous attitude of negligence. Reward and punishment measures are put into effect, specifying that 20 fen shall be awarded for one sheet of pigskin. The money will be distributed to the individuals after collectively received. Those who are responsible for arbitrary negligence in pig skinning will be investigated and duly punished. In this way, the positiveness in pig skinning of the employees and workers will be encouraged. Meanwhile, skinning technique will be advanced, the meat-to-skin ratio will be lowered, and the quality of pigskins will be improved.

After the above measures were taken, all of the city's 16 meat sales departments and the three suburban food stations have made it possible to skin one sheet from each pig. Since last September, more than 300 sheets of pigskins on an average were done each day, with the highest record of more than 500 sheets in a day. Monthly average in September, October and November reached more than 10,000 sheets, making the highest level in history.

9503

CSO: 4007

NATIONAL

COMMUNE, BRIGADE ENTERPRISES SUCCESSES, EARNINGS REPORTED

Guangzhou NANFANG RIBAO in Chinese 13 Jan 80 p 2

[Article by a reporter and a practice reporter of Zhongshan University:
Provincial Fair for Commune, Brigade Enterprises Products]

[Excerpt] Commune and Brigade enterprises are an essential part of the national economy. At the show windows of the fair, we have seen that commune and brigade enterprises involve many trades and professions and there was a wide variety of products, thus playing an important role in enriching the lives of the masses and in supporting the industrial and agricultural production and export.

In front of Nanhai County's display stands, people stayed to watch some of the novel, shining metallic buttons, pins and leather belt buckles. Although these hardwares are essential in people's living, they are usually in shortage in the market because some plants are reluctant to produce them as they use more labor and yield less profit. In viewing this situation, the Nansha Brigade of the Xiangtang Commune in Nanhai County has set up a hardware plant. Using wastes and scraps of large plants, it produced hardwares in 1978 valued at 2.17 million yuan. They had promising sales in 28 provinces (cities) in the nation, and a part of the products also joined the south-eastern markets. Commune and brigade enterprises also made a great contribution to export trade. For instance, 80 percent of the drawn work exported from Shantou prefecture was provided by commune and brigade enterprises. At the fair, all the artistic handicrafts, wood carvings, jade carvings, marbles, etc are items which can earn foreign exchange for the nation through export trade. For commune and brigade enterprises in Foshan Prefecture only, their export products were valued at nearly 100 million yuan in 1978.

Promoting commune and brigade enterprises has not only vitalized the urban and suburban economy, but has also enhanced agricultural mechanization. At the fair, the spray irrigation machinery and steel windowsills produced by the Dengfeng Brigade of the Shahe Commune in suburban Guangzhou City have drawn the attention of the reporters. A responsible comrade of the Suburban Commune

and Brigade Enterprises Bureau related that this brigade has set up a machinery processing plant, with industrial sideline products income to be 78 percent of the brigade's total income. Using the large amount of capital accumulated by the plant, they vigorously engaged in the basic construction of farmlands, making possible spraying irrigation of all 500 mu of vegetable planting. In 1979, vegetable produce per mu were more than 25,000 jin, each member's average distribution was expected to be 568 yuan and each labor's average distribution was 988 yuan, thus becoming known as the unit with the highest production in suburban Guangzhou City. We understand that the provincial commune and brigade enterprises' total income was 3.05 billion yuan in 1979, which was 34.8 percent of the commune's third-grade economy. 450 million yuan was accumulated during the year, and the capital used for mechanization, agricultural basic construction and aid to the poor brigades amounted to more than 120 million yuan.

Since the opening of the fair, customers arrived by the hundreds and the thousands, and business was very prosperous. Customers constantly flooded the retail counters of Foshan, Guangzhou and Shantou Prefectures. Many products became fast sales items once they were seen by the mass of the people, making the supply usually not enough to meet the demand. Since the opening of the fair, attendance has exceeded 78,000 with people coming from a variety of places, retail sales amounted to more than 70,000 yuan, and orders accepted for products amounted to more than 2.74 million yuan. All these pointed to the bright outlook in the development of our province's commune and brigade enterprises.

9503

CSO: 4007

EARNINGS OF COMMUNE MEMBERS IN FOSHAN PREFECTURE GIVEN

Guangzhou NANFANG RIBAO in Chinese 16 Jan 80 p 1

[Article by Liang Kosen [2733 0668 2773], Li Hua'jiu [2621 5478 1432] and Wang Nan [3769 0589]]

[Text] The Agricultural Awards Meeting was held by the Foshan Prefecture Party Committee and the Prefecture Administration Bureau on 12 January, making awards to the 1979 advanced agricultural production units and thus encouraging them to make more accomplishments in this new year.

Under the spiritual guidance of the Third Plenary Session of the Central Committee of the CPC, Foshan Prefecture in the last year earnestly carried through the policy of undertaking concurrently agriculture, forestry, animal husbandry, sideline productions and fishery, and gradually moved on the road of joint operations of agriculture, industry and commerce, resulting in bumper crops of agricultural products. Gross and separate productions of foodstuffs increased by 9.2% and 14.2% respectively over last year. Pigs continuously grew on the basis of the growth in 1978, and pond fish, peanuts, soy beans and other industrial crops also enjoyed bumper crops, with the prefecture's gross agricultural income surpassing the highest level in history. Distribution to the commune members increased markedly, with each member's average earnings reaching 145 yuan. On separate and gross productions of foodstuffs, distribution of members' earnings and contributions to the nation, Kaiping, Nanhai and Enping Counties each made the highest level in history. Nanhai, Kaiping, Sanshui, Taishan and Enping Counties all over-fulfilled the nation's foodstuffs purchase assignments. There emerged in all of the prefectures a lot of high production, high income and high distribution communes and brigades. After evaluations have been made by the counties (cities), Kaiping, Nanhai and Enping Counties and 13 communes were awarded respectively political prizes and material prizes (including automobiles, citations, etc.). In these advanced units, the Jinji Commune of Kaiping County continuously overtook historical records in three consecutive years in foodstuffs productions, gross incomes, member distributions and fulfillment of national assignments; the Dali Commune of Nanhai County had an overall increase in production and income, and each member's average distribution reached 238 yuan; and the Niwan Commune of Doumen

County had completely turned over for the better in one year with each member's average sales of foodstuffs of 661 catties to the nation. In addition, banners were awarded to Sanshui County and Taishan County who didn't set a new record in productions but more than completed the foodstuffs assignments.

9503

CSO: 4007

BRIEFS

AFFORESTATION CIRCULAR--The CYL Central Committee and the Ministry of Forestry recently issued a joint circular to mobilize CYL members and young people throughout the country to actively take part in an afforestation movement as tree-planting day on 12 March draws near. The circular calls on CYL organizations and forestry departments to organize young people to join the masses in planting trees to build timber forests, protective forest belts, economic forests, forests for protecting the environment and farmland protection forest networks. [Beijing Domestic Service in Mandarin 1200 GMT 13 Feb 80 OW]

PASTURELAND STUDY CLASS--Nanning, 9 Feb--The general survey committee for natural resources under the Chinese Academy of Sciences and the agricultural bureau of Guangxi Zhuang autonomous region jointly held a study class recently to train technical personnel in the survey of mountain and slope grass land in China's southern regions. The 12 provinces and autonomous regions in southern China are located in tropical or semi-tropical zones, where some 1 billion mu of pastureland has not been fully developed and utilized. [Beijing Xinhua Domestic Service in Chinese 0202 GMT 9 Feb 80 OW]

AGRICULTURE BANK--Beijing, 8 Feb--The Chinese Agriculture Bank has recently notified agriculture banks in all localities to trial-implement a system of using rural deposits for agricultural loans. Under the system, the more deposits and loans a bank can organize and collect, the greater loans it can provide. [Beijing Xinhua Domestic Service in Chinese 0240 GMT 8 Feb 80 OW]

HYBRID RICE PRODUCTION INCREASES--Beijing, 11 Feb (XINHUA)--The ministry of agriculture reported today that more than five million hectares were planted to hybrid rice in China in 1979, an increase of 150 percent over 1978. The harvest yielded 3.9 million tons more grain, accounting for one third of the total increase throughout the country last year. Use of high-yield rice began in 1973, and became more widespread beginning in 1975. [Text] [OW110750 Beijing XINHUA in English 0731 GMT 11 Feb 80 OW]

HENAN, SHANDONG BUMPER HARVEST--Zhengzhou, 18 Feb--A bumper harvest has been reported on 16 million mu of farmland in Henan and Shandong provinces irrigated with water drawn from the Huanghe River. The 58 low-yield counties under 13 prefectures and municipalities along the Huanghe River have reported good harvests, with the per-mu grain output rising from 200 jin in the past to 570 jin in 1979. The total grain output in Yuanyang County, Henan, reached 413 million jin with a per-mu yield of 623 jin in 1979. [OW201055 Beijing XINHUA Domestic Service in Chinese 0157 GMT 18 Feb 80 OW]

NATIONAL CONFERENCE ON PRAWN CULTIVATION--Beijing, 30 Jan (XINHUA)--China caught 1,245 tons of prawn raised artificially last year. This was 2.8 times the catch of the previous year. News of the big catch was announced by Zhang Zhao, deputy chief of the National Bureau of Aquatic Products, to the delegates at a national conference on prawn cultivation which opened today. China started extensive prawn breeding in 1978. Prawn cultivation is now found in 50 counties and cities along the coast. Sixteen breeding centres have been built during the last two years. The bred-prawn is appreciated for its freshness and delicious taste. Prawns are well processed and stored with modern facilities. 230 tons were exported last year. The present conference, attended by provincial and municipal aquatic products bureau chiefs and specialists along the coast as well as from scientific institutions, was called to exchange experiences and work out plans to boost production for the coming years. [Text] [OW301544 Beijing XINHUA in English 1517 GMT 30 Jan 80 OW]

CSO: 4020

'XINHUA' ON EAST CHINA COUNTY ACHIEVING GOOD 1979 HARVEST

OW150818 Beijing XINHUA in English 0746 GMT 15 Feb 80 OW

[Text] Hefei, 15 Feb (XINHUA)--On the front doors of many new peasants' homes recently built in Fengyang County in East China are scrolls bearing inscriptions such as "this is a golden time" and "the present is immeasurably better than the past". Traditionally, Chinese families put up scrolls on their front doors to express their aspirations and feelings.

The peasants in Fengyang County, an area driven by natural disasters in the past, are pleased because of their 1979 grain harvest, which reached an all-time record of 220,000 tons, an increase of nearly 50 percent over the preceding year. Output of rapeseed and other oil-bearing crops was 7,000 tons, also a new record. As a result of the good harvest, peasants are putting up new homes, purchasing furniture, and buying not only cotton and synthetic fabrics but also woollen textiles and a great variety of other items.

In this country with a population of 460,000 on the southern bank of the Huai River, periodic floods and droughts used to drive peasants from their homes before liberation, and many people eked out a living by hiring themselves out as laborers or singing ballads on the streets. A ballad then popular among the people ran:

"Our country suffers from famine nine years out of ten
while the rich families take the opportunity to buy land,
the poor sell their children,
with no children for sale,
I wandered here and there,
what I have with me is only a cymbal for ballad singing."

This year, all 96,000 peasant families in the county, even those who were once the poorest, have ample food grain in store. Since last autumn's harvest, Fengyang County has produced and sold to the state 20,000 tons of surplus grain. The public accumulation fund set aside by the people's communes in the county for the expansion of production has increased by two thirds as compared with that for the preceding year.

Fengyang is one of ten poorer counties in Anhui Province which chalked up a marked improvement in farm production in 1979. The ten counties, with 730,000 hectares of farmland or one tenth of the farmland of the province, increased their grain output by half a million tons last year compared with 1978, and the income of the peasants rose appreciably.

People in Fengyang County attribute the 1979 good harvest to the implementation of the party's rural economic policies, including the policy of paying each according to his work and giving the production team more leeway on matters of management. Another basic factor is the construction of dykes and other projects that has in the main eliminated flooding, and the improvement of irrigation and drainage. The irrigated area now accounts for 60 percent of the country's 66,000 hectares of farmland.

CSO: 4020

BRIEFS

ANHUI GO-AHEAD PEASANTS--Hefei, 29 Jan--Two young peasants who offered to become production team leaders on communes in Anhui Province, East China, last year have been praised in the newspaper the ANHUI DAILY for their efforts in pushing up production and incomes. The paper commented that it hoped more talented rural cadres would follow their example. Li Yongye volunteered to lead the Limiao production team in Gudian Commune, Fengtai County last spring. Li introduced crop rotation and rape-seed and cotton crops and directed the reclamation of nearly a hectare of wasteland for growing vegetables. The production team has set up a carpenter shop, a pig farm and grain mills. Incomes rose to double the 1978 figure. Jiang Licheng volunteered to lead the Xuxi production team Bianzhuang Commune, Jiashan County. His approach was "more pay for more work"--and at the end of 1979 the production team's collective and individual incomes were the highest in Bianzhuang. [OW291229 Beijing XINHUA in English 0252 GMT 29 Jan 80 OW]

AFFORESTATION PLAN--According to ANHUI RIBAO since the Anhui provincial people's government held a telephone meeting that called for immediately whipping up a high tide in the winter-spring afforestation campaign, an afforestation and land leveling campaign has been in full swing throughout the province. The province has leveled 319,000 mu of land, and afforestation has started in many places. As of 20 January, Anqing prefecture had leveled 130,000 mu, about 50 percent of the task. [OW020315 Hefei Anhui Provincial Service in Mandarin 1100 GMT 31 Jan 80 OW]

CSO: 4007

BEIJING

BRIEFS

BEIJING DUCK BYPRODUCT—Beijing, 23 Jan—Beijing duck, which gourmands throughout the world recommend, is yielding down for feather factory signed contracts with 6 countries and earned 1.1 million U.S. dollars for the country last year. [sentence as received] Beijing previously did not process its duck feathers and down but shipped them south for processing. Sometimes they were used only as fertilizer in the villages. [Text] [OW231215 Beijing XINHUA in English 0144 GMT 23 Jan 80 OW]

CSO: 4020

FUJIAN

RAIN, SUGARCANE COMPETE FOR LAND

Beijing RENMIN RIBAO in Chinese 23 Nov 79 p 3

[Article by Yu Jinman [0151 6855 3341] of the Fujian Provincial Planning Committee, "Some Problems for the Modernization of Agriculture as Seen in the Competition for Land by Grain and Sugarcane"]

[Excerpts] Fujian Province lies in the subtropics where the climate is warm, the rainfall abundant, and the periods of sunshine long, natural conditions favoring the cultivation of sugarcane. As long ago as the middle of the Ming Dynasty, a manual sugar extraction industry was already thriving here. Following liberation cane sugar production in Fujian Province developed quite rapidly with production tripling within the space of 3 years, the amount of upward adjustment growing four fold and the state, the prefectures, the communes and brigades and the commune members rejoicing.

Further growth of sugarcane production in Fujian encountered difficulties, however, the main reason being that the problem of competition between grain and sugarcane for growing space had not been properly solved.

In Fujian at the present time, land averages only 0.8 mu per person. In the abundant sugarcane producing regions along the south coast, the average is only about 0.5 mu per person with grain levels for the personal consumption of commune members being quite low. Consequently, in the apportionment of land there is always competition between grain and cane. If sufficient grain is to be grown with annual increases for personal consumption assured, there can be no expansion in the area planted to sugarcane; if there is rather large development of sugarcane, grain production and increases in the level of grain for consumption cannot be assured. Thus, how to properly handle the relationship between grain and cane and the problem of how to solve the competition for growing space between grain and cane is at the crux of whether there will continue to be high speed development of cane sugar in Fujian.

In the period since liberation, cultivated land in Fujian has decreased by 11 percent while population has increased 1.06 times, meaning an average

decrease of more than one-half in the amount of cultivated land per person. Though per unit grain production has increased from 287 jin to 873 jin, nevertheless the amount of grain available per person did not reach the highest recorded levels last year and increased by only 116 jin over 1949. If an average 800 jin is to be attained on the basis of the 1985 population, per unit production must be increased more than 300 jin over what it is at present. To reach this objective from the already fairly high yields per unit area will not be easy. Moreover, unless some changes are made in current grain consumption and demand, even if per person averages reach 800 jin, grain may still seem to be less than plentiful. This is to say that unless some other means are found instead of depending solely on increased per unit yields of grain to solve the conflict for space between grain and cane, cane sugar production can only be pushed hither and yon to develop slowly. Consequently, if the conflict for land between grain and cane is to be solved with large scale development of cane sugar taking place, for the long haul there must be a liberation of thought, and methods explored through the modernization of agriculture for a fundamental solution to the problem.

Our national diet at the present time consists of between 80 and 90 percent grain. If we can change this diet gradually with continuous increases in the proportion of meat, fish, eggs, milk, fats, sugar, and fruits, and gradual decreases in the proportion of grain in the diet, the amount of demand for grain can be reduced while at the same time the same amount of grain can continue to be produced while the rate of self-sufficiency can be enormously raised with surpluses even being possible. In this way it will be possible to apportion more cultivated land to the development of other crops. Many advanced countries have had this kind of experience. If the composition of the diet is to be changed, the internal structure of agriculture, forestry, livestock, sideline enterprises, and fisheries with vigorous efforts made for the development of the forestry, livestock, and fishing industries. Ours is a vast land in which the topography and climate are varied, and in which the natural conditions are very good for the development of the forestry, livestock and fishing industries to bring about a gradual change in the diet. In Fujian, for example, where the terrain consists of eight-tenths mountains, one-tenth water, and one-tenth farmland, there are 100 million mu of forest lands, 30 million mu of grasslands, 3,300 kilometers of seacoast, 1.5 million mu of beaches, and 650,000 mu of fresh water that can be used for hatcheries and the cultivation of aqueous plants. All this provides extremely favorable conditions for the development of economic crops and the forestry, livestock, and fishing industries. At the present time, however, the forestry, livestock, and fishing industries comprise only 5.8, 9.5, and 4.9 percent of agriculture in the entire province. One of the main reasons that the proportion of forestry, livestock, and fishing industries is so low is that for many years people have narrowly supposed that "to farm is to grow grain," and that "full stomachs depend on grain alone," with full attention being given, in consequence, to grain alone to the neglect of all else. Acting under the influence of the extreme left line of Lin Biao and the "gang of four," tangerine trees were needlessly cut down, mountain forests destroyed,

and ponds filled in. Narrowness of vision about agriculture has caused our eyes to focus only on the one-tenth of the total area of the province that is farmland and to make not very good use of the 99 percent of the entire province that is mountainland and water.

The area of our country is vast and the natural conditions extremely varied. Large scale increases in agricultural products and the construction of a modernized agriculture will require us to start with the growing conditions for living things, to break the ideas of a small farm economy of scattered small self-sustaining units, and to institute instead overall planning either nationwide or in a zone of cooperation, with the adaptation of methods to local conditions, rational overall land apportionment, appropriate centralization, and the implementation of regional specialization of production and cooperation, with vigorous efforts in the development of production of socialist agricultural commodities and their exchange, and an increase in the proportion of agricultural commodities and the productivity of labor. Only if things are done in this way in accordance with natural laws and economic laws can the greatest economic benefits be realized. Of the six provinces and one municipality of east China, the southern coastal area of Fujian has better conditions than any other province or municipality for the production of sugarcane. Compared with neighboring Zhejiang Province, the average per mu production of sugar from high yield areas is one or two times greater in Fujian. On the other hand per unit yields of grain in Zhejiang Province are between 30 and 40 percent higher than for high yield areas in Fujian. If, in order to increase grain production, Fujian were to cut back on some sugarcane while Zhejiang were to restrict grain production in order to expand the area planted to sugar cane to meet needs for sugar, from a production management standpoint this would be, without doubt, a huge waste of natural resources. If, however, Zhejiang and Fujian can cooperate in grain and sugar production, that would be for their mutual aid and benefit and they would complement each other. Cooperation of this sort, whether nationwide or within a zone of cooperation, constitutes an economic success. If the whole situation were taken into account nationwide or in the East China region, expansion of the area of cane cultivation along the south coast and the development of production of sugarcane would multiply many times over.

From this it may be seen that to build modernized large scale agriculture there must be overall planning, rational apportionment of land, and specialized production and cooperation. During the 1850's, the United States began the formation of commodity maize belts and commodity wheat belts, which together with the further specialization of agricultural production and production of other commodities constituted an important measure in the modernization of American agriculture and one from which we can draw useful lessons.

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CSO: 4007

BRIEFS

COMMUNE, BRIGADE ENTERPRISES--In 1979, the total income from the commune and brigade enterprises in Nanjing County reached 10.64 million yuan. This is an increase of 42.8 percent over 1978. Some 80 percent of the areas in this county are mountainous. The weather is mild, the rainfall is sufficient, the soil is fertile and natural resources are rich, providing fine conditions for developing the diversified economy. In 1979, the people in this county planted trees on 49,000 mu, providing a large quantity of timber, bamboo, resin and honey. At the same time, there were 125,000 pigs in the county, giving an average of 2.7 head per household. Savings in the cities and towns increased by 36.5 percent over 1978, while savings in the countryside increased by 46.9 percent. [Fuzhou Fujian Provincial Service in Mandarin 1035 GMT 30 Jan 80 HK]

TEASEED HARVEST--By 15 January, the people in Fujian overfulfilled the tasks of purchasing teaseed oil by 6.5 percent. The teaseed oil in storage throughout the province increased by 2.7 times over 1978. Ningde prefecture is well-known for producing teaseed oil. At present, 5 million jin of teaseed oil have been stored in this prefecture, accounting for 50 percent of the total purchase of teaseed oil throughout the province. [HK010215 Fuzhou Fujian Provincial Service in Mandarin 1035 GMT 23 Jan 80 HK]

CSO: 4007

GANSU

BRIEFS

AGRICULTURAL CREDITS--In 1980 the agricultural banks and credit co-operatives in Gansu Province will grant 300 million yuan of credit to rural communes and brigades, an increase of 10.5 percent over that of 1979 and equivalent to 41.6 percent of the total amount of means of agricultural production planned to be supplied in the province in 1980. A responsible comrade of the provincial agricultural bank calls on all agricultural banks and credit cooperatives to use agricultural funds in developing agriculture, in helping communes carry out projects which need small investments and can yield quick and great results and in developing farm mechanization and sideline production. [SK070524 Lanzhou Gansu Provincial Service in Mandarin 1125 GMT 30 Jan 80 SK]

CSO: 4007

AGRICULTURAL PROGRESS REPORTED AT GUANGDONG PEOPLE'S CONGRESS

Guangzhou NANFANG RIBAO in Chinese 24 Dec 79 p 3

[Article: "Conditions are Excellent for Progress Riding the Victorious Tide; Side Notes for the Second Session of the Fifth Guangdong Provincial People's Congress"]

[Excerpt] The second session of the Fifth Guangdong Provincial People's Congress was opened impressively on the eve of the first anniversary of shifting emphasis. For days, more than 1,500 delegates representing various fronts all over Guangdong Province conscientiously discussed and argued over the "Government Work Report" presented by Chairman Xi Zhongxun of the Provincial Revolutionary Committee. They talked freely of the excellent conditions that Guangdong Province possesses. All were in agreement that the words "steady policy, active ideas, stable feelings, developing production and everybody jubilant" used in the report have best summarized the general conditions in Guangdong today and matched its objective reality and expressed the innermost thoughts of the vast majority of its masses.

During the session, a large number of rich factual evidences were brought up by many delegates in support of the excellent conditions described by the words "developing production and everybody jubilant." The party committee secretary of Foshan Prefecture, Yang Deyuan [2799 1795 0337], excitedly said that in his prefecture there was a significant increase in production of grain, oil, beans, live hogs together with income. Grain production in particular increased more than 10 percent over last year. Other fields have also presented a picture of prosperity with increased income and improved living conditions for the commune members. A preliminary sign of a rich and abundant future for the Zhujiang Delta has been revealed. The party committee secretary of Shantou Prefecture, Liu Junjie [0491 0193 2638], also listed a large number of facts to describe the excellent conditions which have materialized as a result of mobilizing various positive factors and conscientious implementation of various agricultural economic policies since the "gang of four" was crushed

and especially after the Third Plenum of the Party Central Committee was held. The entire area was able to achieve increased grain harvests for 3 years in a row. Although the late crop in the Hailufeng [Haifeng-Lufeng] area was seriously damaged by natural disaster, the total grain production of the entire prefecture this year was still 66 million jin more than that last year. The average per mu yield of paddy rice this year reached 1,262 jin which was 93 jin more than that last year. Cash crops have also experienced different degrees of a bumper harvest. Peanuts in particular achieved a per mu yield of 237 jin this year with a total output which was 45 percent more than that of last year, surpassing the historic record by 400,000 dan. This prefecture had failed to accomplish the assigned food and oil production for many years. They have accomplished their task for this year in the first half of the year. The live hogs sold to the state has also increased 66 percent over that of last year.

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CSO: 4007

GUANGDONG CALLS FOR AGRICULTURAL DEVELOPMENT

Guangzhou NANFANG RIBAO in Chinese 20 Dec 79 p 1

[Article: "Xi Zhongxun Proposes Strategic Ideas for Development of Agriculture in Guangdong; Fully Utilize and Develop Wide World of Agriculture, Forestry, Animal Husbandry, Fishery, and Sideline Enterprises"]

[Text] In his "Government Work Report: Chairman Xi Zhongxun [5045 0112 8113] [of the Guangdong Provincial Revolutionary Committee] stated that Guangdong Province has a large population and a little land, so that a strategic idea is required to develop its agriculture. While striving to increase per mu yield of the existing cultivated land of 48 million mu, it must also strive to develop the superiority of 180 million mu of hilly areas, some 10 million mu of river and lakes, and more than 4,000 kilometers of the shoreline. By doing so, we will be able to develop wide world of agriculture, forestry, animal husbandry, fishery and other sideline enterprises.

Chairman Xi Zhongxun pointed out that the cultivated land area for grain crops in this province is small and the foundation for grain production is weak. Rearrangement of the grain yielding area must be done very carefully in order to guarantee a steady increase in grain production. Development of cash crops must also be aggressively carried out according to what the local conditions dictate and under the premise of achieving larger grain yield by gradually increasing the planting area of cash crops. A number of bases must be established in this province, including commodity grain, cash crops, animal husbandry, fishery and forestry bases. Agricultural resources investigation and agricultural district planning must be done well by every level and an overall development plan must be drawn up so that long range production prospects and short range production tasks are clearly defined.

Chairman Xi Zhongxun brought up some specific needs concerning agricultural production of the next two years and expounded that agricultural development must rely on the policy, style, and scientific cultivation techniques together with some material guarantees. He emphatically pointed

out: To solve the food problem of this province we must step-by-step transform its agricultural structure and food structure. One of the important measures is to increase the importance of fishery and animal husbandry in the overall agriculture. He suggested that while striving to increase hog production, production of herbivorous animals such as cattle, sheep, and rabbits must also be aggressively pursued. We must try to develop a modernized animal husbandry. We must do well in ocean fishing and positively develop salt water breeding and cultivation [of aquatic life]. The water reservoirs and rivers and lakes must be fully utilized and net-box fish farming must also be developed. Salt production must be assisted and cared for with appropriate effective measures. Production in mountain areas must be aggressively developed with forestry as the mainstay combined with grain production and overall development of a diversified operation.

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CSO: 4007

WINTER DISEASE, INSECT CONTROL CARRIED OUT

Guangzhou HANFANG RIBAO in Chinese 20 Dec 79 p 4

[Article by Lai Zhenru [6351 4176 1172]: "Winter Curfew Comes First Among All Barriers On All Roads; A Talk About Prevention and Treatment of Winter and Spring Diseases and Pests"]

[Text] With coming of winter, a greater majority of diseases and insects harmful to agricultural crops will over winter in the field by remaining in the residues of the affected plants (such as leaves and fruits). This is the advantageous time to carry out disease and pest control. The major measures include the following:

1. Removal of sites where diseases and insects may over winter: Grass is the main site where *Pachydiplosis oryzae* wood-mason over winters. In areas infested by this insect, combine the removal of grasses from ditches, culvert, and edge of field with the winter-spring activities of gathering and storing of fertilizer. In 1975, Wenquan Commune of Chonghua County neglected control of this pest by removal of the grass and, as a result, a great damage was done by this pest to the late rice with the damage rate (hai biao conglu?) reaching 11.4 percent. In 1977, as a result of removal of grass during the winter-spring time, the average damage rate was only 2.7 percent.

2. Clean the field. Areas affected by rice blast and white withering (*Xanthomonas oryzae* [Uyeda et Ishiyama] Dawson) should treat the affected straw stubble immediately after the late rice is harvested. The grains from the affected field should not be used as seeds. Areas affected by rust of peanut must, after the fall harvest, be cleared of all affected vines and treated. Before sowing in the following spring, the field must be cleared of all seedlings which have germinated from dropped peanuts in order to reduce propagation of the disease. If sugar cane roots are to be saved, sugar cane must be harvested by cutting it low. If roots are not to be saved, sugar cane should be harvested by plowing. After harvesting, the cane field must be immediately cleared of all roots, dry leaves and stems.

3. Flood the field early in spring. Rice straw stubble is the site where yellow rice borer (*Tryporyza incertulus* Walker) over winters. Rice fields, which are plowed in winter to be dried or planted with green manure and no roots are to be saved, should be flooded early in spring before the pupae can mature into moths in order to kill as many pests as possible. Fields which are planted with green manure and the roots are to be saved, should receive frequent application of liquid manure in spring, or flooded for three days and nights before the pupae can mature into moths. More than 90 percent of the yellow rice borers can be destroyed by these two methods. Areas affected by sheath and culm blight of rice should, after flooding the field, collect and remove the foam formed at the downwind corner of the field in order to reduce the source of this disease.

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CSO: 4007

GUANGDONG REPORTS ANNUAL AGRICULTURAL FIGURES

Guangzhou NANFANG RIBAO in Chinese 27 Dec 79 pp 1, 3

[Article: "Guangdong Province Rejoices Over Bumper Agricultural Harvest; Total Grain Production Increased 1.5 Billion Jin Over That of Last Year; Sugar Cane Experienced a Bumper Harvest 2 Years in a Row; Peanut Output was Highest Since Liberation; Soybean, Rape, Pond Fish, Hogs and Cattle Also Experienced Increased Production"]

[Text] Xinhua, 26 December, Guangzhou: Xinhua reporters Wang Zhenhua [3076 2182 5478] and Chen Yexian [7115 2814 6513] report: Guangdong Province achieved a bumper agricultural harvest this year. After achieving increased production from grain crops including early rice, the entire province except a few prefectures where a slight decrease in production was experienced because of flood and cold temperatures experienced bumper harvest of late rice as well.

According to the data provided by the agricultural department, the total grain production in Guangdong this year was 1.5 billion jin more than that of 1978. Sugar output achieved a bumper harvest 2 years in a row, with total production this year reaching 8 million tons. Peanut output this year was the best since Liberation with the total output reaching 8.3 percent more than that of last year. Outputs of soybeans, rape, pond fish, hogs and cattle have also experienced increases.

The rural areas all over Guangdong Province have thoroughly implemented the spirit of two documents concerning development of agriculture issued by the Third Plenum of the Party Central Committee and the policy to respect the right of self-determination of each production team. Communes and production teams everywhere made their cultivation plan according to the local conditions and the actual situation thus not only guaranteeing completion of the production tasks assigned by the state but also making agricultural arrangement more rational. As a result, agricultural byproducts increased in general while trading at the village became more active, and everybody, including the nation, the collective, and the commune member, have benefited. The commune members were particularly delighted.

Since last winter, the farm villages all over Guangdong Province conscientiously implemented the policy of distribution according to the labor. More than 70 percent of the production teams began to practice contracting at the work group level, a production responsibility system in which remuneration is calculated according to the production and other forms of the production responsibility system. This promoted one step further the enthusiasm of the commune members to participate in collective production labor and liberated productive forces to significantly raise the agricultural labor productivity. Practice over one year has proven that the increase in production of various crops was larger and considerable amount of labor that was saved was used for the diversified operation and development of industrial and sideline enterprises in those communes and production teams which practiced contracting at the work group level and calculating remuneration according to production.

All villages, communes and production teams of the entire province have increased their income thanks to increased grain production, development of diversified operation, prosperous industrial and sideline enterprises of the communes and production teams coupled with a rise in prices of some of the agricultural and sideline products. The income of the commune member distributed collectively has in general increased 20 percent over that of last year. Villagers are jumping up and down for joy.

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CSO: 4007

VANDALISM AT HAINAN TROPICAL CROP INSTITUTE REVEALED

Commentary on Problem

Guangzhou NANFANG RIBAO in Chinese 9 Jan 80 p 3

[Article by Resident Commentator: "Everyone Must Care for the Scientific Research Base With Affection"]

[Text] A letter published by this daily today, entitled "Our Scientific Research Base Has Suffered Severe Destruction," and what has been uncovered by an investigation made by our reporters in response to it, is truly shocking. To see such a wonderful scientific research base, which has contributed so much to the development of tropical crop production in this country, suffering such reckless destruction and trampling is really painful to the heart, especially at a time when we must emphasize protection of scientific research bases.

We have entered the first spring of the 1980's of the 20th century. In order to realize the Four Modernizations by the end of the 20th century, and to build this country into a modern and strong socialist nation, the people of this country must shoulder up to this great historic mission. The key to early realization of the Four Modernizations and to acceleration of the economic development of this country lies in the modernization of scientific technology. The Tropical Plant Research Institute of South China is the first and largest scientific research base for the study of tropical crops in this country. Like all other scientific institutes scattered all over the country, its missions are to produce scientific and technological results and to cultivate scientific and technological personnel who are as specialized in their field as they are red in support of the Four Modernizations. Every single scientific research activity of the institute is closely related to the Four Modernizations. Every bit of scientific research achievement made by the institute will add a portion of strength to the Four Modernizations. Therefore, we must respect their endeavor and hard work, support their scientific research activities, and care for their scientific research achievements with affection. Reckless destruction of a national scientific research base is a criminal act detrimental to the Four Modernizations.

The reason why the Tropical Plant Research Institute of South China received such serious destruction is said to be due to encroachment by the institute upon the land of neighboring communes. This is nothing but an excuse. Because the land owned by the institute and used for the purpose of various production and scientific experiments was included in the plan when the institute was first established and formally approved by the higher level of government, with all procedures complete and proper and no room for dispute. Let's give a concession and retreat 10,000 steps. If there were any dispute concerning the land at all, it ought to be solved through negotiation under the supervision of the concerned local leading party organization. However, some time ago, a few cadres of the commune incited the masses to attack the institute, not only seriously destroying the scientific research base and incurring irreparable losses to it but also destroying the stability and unity of the area. This kind of action cannot be tolerated either by the regulations of the party or the laws of the nation. The local party political leader and the concerned governmental department must conscientiously assist the concerned cadres and the masses by summarizing the lessons to educate them about the correct relationship between the nation, the collective, and the individual; to eliminate the factors conducive to instability; and to raise the level of understanding of the importance of scientific research so as to promote everyone's self-confidence to care for and support the work of the Tropical Plant Research Institute. The local public security and judiciary department must capture the destructive elements and punish them according to the law, in order to safeguard the smooth operation of the scientific research work.

Letter to the Editor

Guangzhou NANFANG RIBAO in Chinese 9 Jan 80 p 3

[Article by Xiao Yong [5135 3057] and Huang You [7806 2589] of the Tropical Plant Research Institute of South China: "Our Scientific Research Base Has Suffered Severe Destruction"]

[Text] Comrade Editor:

The science and technology front of this country has finally begun to blossom since the National Science Convention was held. However, we are continuously having troubles here with matters related to the destruction of the scientific research base. These incidents really cut one to the heart.

Our institute is located in a village in Dan County on Hainan Island. Since August 1978, a few persons from the neighboring villages, with land dispute as an excuse, have forcefully occupied the experimental lot of the institute, destroyed the experimental young rubber plants, felled the experimental production forest, stolen the flowing rubber milk of the experimental rubber forest section, and destroyed the living quarters of the staff and workers. The cadres of a number of brigades, farms,

and stock farms attached to the Baodao Commune surrounding this institute have repeatedly given an "ultimatum" designating the deadline and the section of land and demanding that the institute stop its experiments and production. This institute had reported these incidents to the concerned leading organization promptly but so far has been unsuccessful in catching their attention. They did not take any measures to stop these acts and, as a result, the scientific research work of this institute suffered a severe blow. The superior rubber species comparison section is an important experimental field where this institute cultivates new species of rubber plants. After more than 10 years of painstaking care and cultivation by the scientific research personnel, this institute has selectively cultivated more than 10 high-yielding species and was in the process of authenticating the yield and the other characteristics of these species. But now, the rubber milk has been stolen, the plants have been cut into pieces, and the work related to authentication had to be discontinued. Other scientific research items which have been seriously affected include, for example, the superior rubber species comparison test and biological observation and testing of the structure of rubber tree bark, totaling more than 10 in number. According to incomplete statistics, the dried rubber stolen since last year amounted to as much as 11 tons, valued at 60,000 yuan, and the loss due to destruction of the rubber forest and other equipment such as pollinating rack and rubber cups is said to be more than 16,000 yuan.

The vast majority of the scientific research personnel are extremely angered by such senseless destruction of the scientific research base. These people, who came from various parts of the fatherland, unafraid of hardship, wearing thorns and immersed in their work energetically, work only for the purpose of developing the tropical crop scientific research enterprise of this nation. Some of the scientific research items, which required more than 10 years of painstaking work to gradually build up, have been destroyed overnight. How could one help but feel sad! We wish that the concerned leader and the various levels of administrative and judicial departments would conscientiously control and stop this type of destructive behavior in order to protect the scientific research base so that the scientific research work may better serve the four modernizations.

Investigative Report

Guangzhou NANFANG RIBAO in Chinese 9 Jan 80 p 3

[Article by Reporters Li Tongbo [2621 6639 3131] and Huang Jianchuan [7806 1696 1557]: "The Circumstances of the Destruction of the Tropical Plant Research Institute"]

[Text] The Tropical Plant Research Institute of South China is the first and the largest research institute for the study of tropical crops to be established in this country. There, more than 400 species of tropical plants from 36 countries are being cultivated. Every year this institute carries out a series of important scientific research tasks assigned by

the government. So far they have conducted more than 160 research projects and contributed significantly to the development of tropical crop production in this country. However, since August 1978, the institute has suffered serious destruction of an unprecedented nature. A number of people from the surrounding land kept occupying the experimental lot, cutting and chopping, destroying the experimental rubber plants, forest, and equipment, insulting and beating the workers, so much so that the normal business of the institute could not be continued. Many scientific research projects assigned by the government have been forced to be discontinued, and some of the long-range experimental projects have been damaged so extensively that all earlier efforts were in vain.

Recently, in response to our reader's letter, these reporters conducted an investigation of the Tropical Plant Research Institute. We have found that 14 out of 38 scientific research projects assigned by the government last year have been destroyed. More than 1,000 high-yield young grafted rubber plants of the young state group system comparison section of the fifth team of the experimental farm have been undergoing experiments for 13 whole years. In another 2 years, some preliminary scientific conclusions could have been obtained from this project. But between May and September last year, a number of people banded together to steal rubber, chop down rubber plants, and destroy cups and other equipment. A healthy patch of rubber plant forest is now covered with wounds and the normal experimental projects have all been upset. There are 100 rubber plants in a forest section south of Yugong Bridge of the ninth team of the experimental farm. These rubber plants are used to study ecological laws such as development, growth, rubber yield, and aging under various climatic and management conditions over a period of a year as well as a lifetime. It is a long-range experimental project requiring at least 30 years of continuous study. These rubber plants, too, received irreparable damage over a period of more than 3 months last year, bringing this serious experimental project to a paralyzed state.

Many scientific research personnel lamented: We toiled until our hair turned white, and now our hands have been stripped bare. All our efforts have been in vain!

The Tropical Plant Specimen Garden is one of the important general experimental bases. In this garden are a hardwood lumber forest which grows tall and straight, rare flowers and strange grasses which arouse the people's fancy, precious and rare herbs which are known for their peculiar medicinal effectiveness, tropical fruits which are so tasty, and so on. This garden, which is not only a scientific experiment station but also a tourist attraction visited by many visitors, domestic as well as foreign, could not escape the bad luck of destruction. Ercha [0334 5420] is an herb imported from India some 20 years ago. It is known for its effectiveness for internal hemorrhage. We lack the experience of cultivating this herb in this country today, so that we depend on this institute to provide the cultivation technique as well as its seeds. However, some 20 Ercha plants grown here have been seriously damaged, and the institute will not be able to complete the tasks assigned by the government.

Why weren't the destructive acts against the scientific research base of the Tropical Plant Research Institute of South China prevented or stopped? According to our investigation, there are four reasons:

1. Some cadres of the local commune, under the pretext of land dispute, incited and encouraged the masses in secret or organized and led a band of the masses in person to cause disturbances of the peace. Originally, all the land owned by the institute and used for the purpose of production as well as scientific research was formally approved by the higher level according to the plan and properly filed in 1958 and 1960. All procedures are complete and proper, with no room for dispute. However, some of the communes and brigades surrounding the institute, using an excuse that their land has been invaded and occupied by the institute, repeatedly caused disturbances, with support coming from the concerned leadership. In August last year, when the secretary of a party branch office attached to the Dashi Battalion of Boadao Commune and others plotted with the five neighboring battalions and communes to "take action" against the institute, they were encouraged and supported by the former party committee secretary, Tang Mushen. Within several days, they issued so-called "notices" to the institute repeatedly, unlawfully demanding the return of the land and discontinuation of all experimental projects. Later on, the masses were incited to steal and destroy rubber and rubber plants. Between March and October last year, on many occasions they incited the masses to carry out even more serious thefts. The national property was arbitrarily destroyed and the workers' lives and security were threatened.

2. The local rubber product procurement system was in a shambles, and a portion of the masses took advantage of the situation by stealing and selling the rubber. Rubber is a national defense strategic raw material procured jointly. In the past, all rubber products produced by the privately operated farms in Dan County were bought up by the County Rubber Products Procurement Company. Each production team must be in possession of a license issued by the company in order to be able to sell its rubber products, and all business transactions were done through a bank, without any cash passing hands. Since last year, however, some departments of the county and the supply and distribution stations of a greater majority of the communes, blatantly disregarding the policy and without questioning the sources, bought up rubber products from individuals with cash. What was more serious was the fact that the leading comrade of the county party committee completely ignored this act, which ran counter to party policy, considering it a good measure of "collecting waste articles" or "tapping the wealth," and gave his silent approval and supported it in secret. This attitude encouraged some people to steal the national property.

3. The local party committee member understood only part of the spirit of the document published by the central government. The action taken by a portion of the masses in destroying the national benefit was viewed as a manifestation of "respect for the production team's right to independence" or "easing the farmers' burden." Since August last year, the

institute repeatedly dispatched persons to see the county party committee member, reporting the incidents and requesting that action be taken to stop these kinds of destructive acts. However, the party committee member could not be sufficiently aroused. The individual leaders even defended these destructive acts. Later on, although a work group was dispatched to the area to mediate the dispute, treating the matter as a civil dispute, the fundamental problem remained unsolved. After repeated urging by the party committee of the Hainan area, the County Revolutionary Committee at last published on 1 November last year "an announcement concerning the protection of rubber plants and strengthening of rubber product control." But alas, it was too late.

4. The local authority in charge of public security and law enforcement did not put forth efforts to control the leaders of the destructive bands. Since the year before last, those who have been found to have participated in theft and destruction, assault and battery, or organized and led the disturbances have not yet been dealt with by law.

Scientific research work is one of the important links for realizing the Four Modernizations of this country. The reason why a group of local people participated in the destruction of the scientific research base lies, besides the economic problem, in their ignorance of the relationship between scientific research work and realization of the Four Modernizations, and of the close relationship between scientific research work and the elevation of the material and cultural lives of the masses, including themselves. We suggest, therefore, that the local people's government take the initiative in cooperating with the Tropical Plant Research Institute, and at the same time widely carry out propaganda work to inform and educate the vast majority of cadres and masses of the neighboring villages about the importance of scientific research work so that everyone will automatically care with affection every single blade of grass and every single tree of the Tropical Plant Research Institute and conscientiously support its missions.

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CSO: 4007

MEI COUNTY PLANS, PREPARES FOR 1980 CROP

Guangzhou NANFANG RIBAO in Chinese 6 Jan 80 p 1

[Article by Jin Jianwen [6855 1017 2429]: "Conscientiously Summarizing the Experiences of the Past Year in Order To Achieve a Full Harvest This Year; Mei County Positively Makes Plans and Preparations"]

[Text] The Mei County CCP committee, by conscientiously summarizing the production experiences of the past year and correctly implementing the agricultural production plan, has made a rational adjustment and preparation for the 1980 crop. Today, every commune and production team is busily engaged in the management of the winter crop and preparation for the next crop. The winter grain crop, planted in 120,000 mou of land, and the oil crop in more than 110,000 mou of land all over the county, have by now received one or two applications of fertilizer. More than 7,000 mou of low-yielding fields all over the county have been reconstructed. More than 180 projects related to maintenance and construction of the water system, plowing, and construction of ditches in more than 1,500 mou of land, and planting of fruit trees in more than 900 mou of land, have also been accomplished. Activities related to preparation of the fields for the next crop are being carried out in earnest right now, and more than 3.12 million dan of fertilizer have been collected all over the county.

Mei County was able to increase the production of early maturing rice last year, surpassing the highest level ever achieved in history. The yield of late-maturing rice was slightly below that of the previous year, thanks to the "cold dew wind" (cold dew falls approximately on 8 October) and the fall drought. The production of peanuts, soybeans, sugarcane, live hogs, pond fish, and other sideline industries operated by the communes and production teams has all seen significant development. In order to direct correctly the work related to preparation for 1980 crop production, the county CCP committee not long ago organized and dispatched 10 investigative groups into 10 communes to carry out investigation and study on site in order to summarize past experiences and lessons. Through conscientious investigation and generalization, they conclude that in order to increase agricultural production, we must solve the following two problems concerning production policy so that agriculture, forestry, animal husbandry, sideline industries, and fisheries can all achieve significant growth:

1. We must insist on doing what local circumstances dictate. Grain crop production and the diversified operation and ratio of the rice crop to miscellaneous grain crops must be rationally proportioned. There are mountains, hills, and plains in Mei County. The communes and production teams which developed their agriculture, forestry, animal husbandry, sideline industries, and fisheries according to what the local situations dictate were all able to achieve an overall increase in their production and income last year. Meijiang Commune consists mainly of sandy soil, and it has become the peanut production base of the county. After correcting the mistake of planting paddy rice on more than 1,000 mou of arid land last year, they achieved a full harvest of oil crop. As to the production of food, the past mistake of not allowing the planting of sweet potatoes has been corrected. By planting more than 10,000 mou of sweet potatoes as the late crop, many communes and production teams will not suffer production losses even if they encounter the "cold dew wind" again.

2. We must respect objective reality and avoid a "simplistic" approach. Mei County is rich in complex terrain. The temperature of the high mountain areas, the mountain areas, and the urban plains can differ considerably, and climatic conditions of these areas can also be very different. The reduction in the yield of the late crop experienced by many communes in mountain areas was the result of not grasping this characteristic. The third production team of Heyu Battalion of the Songyuan Commune is situated in a high mountain area. It was able to grow only a single crop in the past. In the past several years, double-cropping was attempted blindly, resulting in a reduced yield of the early crop and a complete failure of the late crop. This production team returned to single-crop production last year and achieved a yield which surpassed the total yield of the two crops the previous year.

Through investigation and study and generalization of past experiences, the CCP committee of Mei County is determined to conduct business according to the laws of nature and economics by making arrangements for this year's agricultural production according to the actual situation in the county. While emphasizing the production of grain crops, other lines of production are also actively broadened. The three operations of planting, breeding, and burning (of bricks, roof tiles, and lime) are united in order to achieve the goal of planting grain crops where the conditions are right for grain crops, and likewise for forestry, animal husbandry, fruit, and the oil crop.

At the same time, we must make rational arrangements for planting food crops according to the laws of nature and the soil conditions. All over the county, there are more than 30,000 mou of well-drained fields suitable for one crop of rice and one crop of potatoes, and more than 7,000 mou of land in the mountain areas where one crop of beans and one crop of rice should be encouraged. Selection of seeds must also be properly planned according to the temperature differential between the mountain areas and the plains, in order to avoid as much as possible the effects of "cold dew wind" on the late crop.

PORK SUPPLIES—Since 21 January a great amount of pork has been shipped to Guangzhou. Pork has been sold in all markets. According to statistics, 7,900 dan pork was sold on 21 January, an increase of 60 percent compared with previous days; 10,460 dan was sold the next day, and an average of 9,000 dan was sold on each of the following 3 days. The demand gradually decreases and the price per jin was lowered by .2 to .3 yuan. [Guangzhou Guangdong Provincial Service in Mandarin 2330 GMT 27 Jan 80 HK]

HAINAN GRAIN CONFERENCE—The Hainan Regional CCP Committee recently held a conference in Qionghai County on grain production bases in the Han area of Hainan. The participants demanded that the various counties strengthen leadership, and seriously run the grain production bases well. Luo Tian, first secretary of the Hainan Regional CCP Committee, attended the conference and gave a speech. Since winter 1978, the regional CCP Committee has designated 18 communes and 60 brigades in 9 counties in the Han area as grain production bases. In 1979, most of these bases achieved big increases in production and became rich quickly. According to statistics from 16 communes and 60 brigades, 49.53 million jin of rice were produced in the year, an increase of 13.6 percent over 1978. The conference demanded that all places concentrate their forces to continue to build the bases well. In the construction of the grain bases, it is necessary to rely on our own efforts since the current finance of the state is limited, and overcome the idea of relying on the upper levels. [HK270837 Haikou Hainan Island Service in Mandarin 0330 GMT 23 Jan 80 HK]

AQUATIC PRODUCTS CONFERENCE—With the approval of the Guangdong people's government, the Guangdong aquatic products bureau held a work conference on aquatic products in Guangzhou from 19 to 24 January. The participants pointed out that it is necessary to emphatically grasp the production of aquatic products since the people want to have more fish and the state has to export more aquatic products. They reveals that at present, one-third of the water surface areas in the province still have not been put into use and the output is still not high. It is also necessary to build a number of new bases for raising fish in ponds in the estuary of the Pearl River. The medium-size cities and the factory and mining areas, counties and towns where the population is dense must raise fish in their suburban areas, so as to increase the supply of fish. A number of commodity bases for raising shrimp should also be built. [Guangzhou Guangdong Provincial Service in Mandarin 2330 GMT 1 Feb 80 HK]

HAINAN AGRICULTURAL TELEPHONE CONFERENCE--The Hainan Regional CCP Committee held a telephone conference on the evening of 23 January to analyze the current situation in agriculture and demand that the various areas strengthen leadership and persist in the struggle to resist drought, so as to whip up a new upsurge in spring plowing and sowing. It was revealed at the conference that at present, 150,000 people are struggling against drought throughout the region, plowing 2.5 million mu of farmland and sowing 45 million jin of seed strains, transplanting 230,000 mu of seedlings, crash planting 120,000 mu of sugarcane and crash tending 200,000 mu of winter sweet potatoes. At present, the drought situation is worsening. Storage of water is now 1,300 million cubic meters less than the corresponding period of 1979. Some of the medium and small rivers have dried up. Spring plowing and sowing are still seriously threatened by drought. Therefore, the party committees and government at all levels must effectively strengthen their leadership over resisting drought and grasp the drought situation and the implementation of the various measures for production. It is necessary to plant peanuts well. [Haikou Hainan Island Service in Mandarin 0330 GMT 30 Jan 80 HK]

HAINAN FIGHTS DROUGHT--To reap a bumper harvest in the early crop this year, all counties in Hainan Island have worked hard to fight drought, and promote winter farmland and water conservancy construction. By the end of the year, 312,000 peasants or 24 percent of the total labor force, were working on 1,200 projects, of which 360 are key ones. They have repaired 5,900 water catchments with a total length of 6,093 km covering a total irrigated area of 165,000 mu. The Hainan Regional CCP Committee has called for the repair of water catchments and the restoration of the total irrigated area since this area was reduced by about 300,000 mu last year due to the people's negligence of water conservancy and serious drought since last autumn. In order to solve the problem of water for the early crop, all counties grasped well keypoint construction work and seriously implemented the party's policies. [Guangzhou Guangdong Provincial Service in Mandarin 1130 GMT 12 Jan 80 HK]

COMMODITY ECONOMY--The people in Foshan Prefecture made full use of the favorable conditions in the prefecture to actively develop the commodity economy. In 1979, distribution in the countryside throughout the prefecture gave an average of 145.50 yuan to each person, an increase of 24 percent over 1978. The scale of increase from the distribution was the highest throughout the province. According to preliminary statistics, the average per person distribution in the countryside of four municipalities and counties reached 200 yuan, while that in 64 brigades was 300 yuan. One hundred and sixty-six production teams reached between 400 and 600 yuan and a number of farming households earned 5,000 yuan with some reaching as high as 8,000 yuan. Located near Guangzhou and Hong Kong and Macao, the prefecture has the favorable conditions for developing the commodity economy. According to statistics, the total income from agriculture was 1,440 million yuan. [Guangzhou Guangdong Provincial Service in Mandarin 1130 GMT 31 Jan 80 HK]

U.S. AZOLLA--By the end of 1979, 8 prefectures and 54 counties and municipalities throughout Guangdong had planted 25 million mu of U.S. azolla. The planting of U.S. azolla was introduced to Guangdong in 1979. This kind of azolla can withstand low temperatures and multiply quickly, has high output with less insect pests and other outstanding conditions. According to analysis of the departments concerned, the areas sown to spring azolla in the province are expected to increase to between 1 and 2 million mu.
[Guangzhou Guangdong Provincial Service in Mandarin 1130 GMT 24 Jan 80 HK]

CSO: 4007

GUANGXI

BRIEFS

GUANGXI COUNTY MAIZE--By 19 January, the peasants in Mashan County have planted 10,190 mu of spring maize. According to weather data this year, the average daily temperature in the county is 10 degrees centigrade after mid-January, and the soil contains comparatively more moisture and is suitable for growing maize. In planting spring maize, the communes and brigades have applied sufficient organic manure, liquid fertilizer and heat-retaining fertilizer. [Nanning Guangxi Regional Service in Mandarin 1130 GMT 24 Jan 80 HK]

CSO: 4007

'XINHUA' HIGHLIGHTS RESEARCH ON CONTROL OF SORGHUM FLY

OW121238 Beijing XINHUA in English 1220 GMT 12 Feb 80 OW

[Text] Guiyang, 12 Feb (XINHUA)—A painstaking agro-technician has won praise and a promotion for his success in bringing under control a sorghum fly seriously harmful to hybrid sorghum in southern parts of China.

During six years of careful research, the technician, Xie Xianglin, identified the fly, *Atherigona soccata rondani*, studied its habits and its specific effects on different types of sorghum then in use, and, as a result, made it possible to greatly increase the output of the hybrid variety.

The sorghum fly was discovered in 1973 when a high-yield hybrid sorghum was first disseminated throughout the Buyi and Miao nationality autonomous zhou (equivalent to prefecture) in the south of Guizhou Province. The fly, which ate leaves at the heart of sorghum seedlings, caused the seedlings to quickly turn yellow, wither and die. In some places, tracts of sorghum seedlings were damaged by the insect and almost no harvest was gathered on 47 hectares that year.

Reports from the counties all proposed that the problem be dealt with. Thirty-five-year-old Xie Xianglin, a 1957 graduate from a middle technical school who was then working at the plant protection and examination station of the zhou's agricultural bureau, offered to undertake a study.

After an extensive investigation of a local sorghum as well as the hybrid variety, he made three findings: damage to the hybrid sorghum was more serious than damage to the local variety; sorghum sown earlier was more seriously harmed than that sown at a later time; and damage to both local and hybrid types was more serious during seedling period than at other stages of growth.

Xie then conducted an investigation covering 17 days and nights, during which he made 71 observations of the life and habits of the fly, with particular attention to the behavior of the larva before it got into the soil and became a pupa. As a result, he discovered that the time of pupation was mainly between five and six a.m.

Xie also studied the various stages of growth in the life of the fly and made comparisons between damage done to the sorghum during different sowing periods and different stages of growth. He also made detailed records of the winter dormancy of the fly.

Xie concluded from all of these studies that the resistance of hybrid sorghum was not as strong as that of the local variety, and that although the sorghum fly bred seven generations a year, the first generation, which coincided with the seedling period, was the most harmful and hence caused the most damage to the crops.

To bring the fly under control, Xie readjusted the sowing period so that the egg-laying period of the first generation of the adult pupa no longer coincided with the sorghum seedling period. This proved to be highly successful in large-acreage sowing.

As a result, output of the hybrid sorghum rose to 6 or 7.5 tons per hectare—four or five times greater than the local variety. In addition, no insecticides were needed and natural enemies of harmful insects were protected.

Xie was recently promoted to work in the biological research institute of the Provincial Academy of Sciences and elected a member of the provincial political consultative conference.

CSO: 4020

GUIZHOU

BRIEFS

AGRICULTURAL EXPERTS' FORUM—On the morning of 7 February, the Guizhou Provincial CCP Committee and the provincial people's government invited some experts in agriculture to a forum to listen to their opinions on how to do a good job of surveying agricultural natural resources, agricultural zoning, scientific cultivation and increasing agricultural production. Responsible comrades of the provincial CCP Committee and the provincial people's government, including Chi Biqing, Su Gang, Wang Chaoven and Zhang Yuhuan, and responsible persons of departments concerned attended. [HK201249 Guiyang Guizhou Provincial Service in Mandarin 2315 GMT 7 Feb 80 HK]

AGRICULTURE CONFERENCE—From 1 to 8 February, the Guizhou Provincial People's Government held a conference in Guiyang on surveying agricultural natural resources, agricultural zoning and scientific cultivation. Responsible comrades of the provincial CCP Committee and the provincial people's government, including Chi Biqing, Su Gang, Wang Chaoven and Zhang Yuhuan, and responsible comrades of departments concerned attended. Also attending were members of the provincial agricultural natural resources survey committee and the provincial agricultural zoning committee and representatives from committees, offices, bureaus at provincial level, scientific research units, universities and colleges. [HK201249 Guiyang Guizhou Provincial Service in Mandarin 2315 GMT 8 Feb 80 HK]

GRAIN PROCUREMENT—After readjusting the grain procurement tasks throughout Guizhou in July, August and September 1979, the base figure of grain procurement was reduced by 24 percent. At present, procurement of grain, edible oil, pigs, cattle, goats, eggs and other agricultural and sideline products has also been readjusted, increasing the income of the peasants throughout Guizhou by 100 million yuan, and giving an average of 4 yuan per peasant. [Hk090121 Guiyang Guizhou Provincial Service in Mandarin 2315 GMT 1 Feb 80 HK]

CSO: 4007

HOT DRY WINDS IN LANGFANG REGION

Beijing QIXIANG [METEOROLOGY] in Chinese No 9, Sep 79 pp 28-30

[Article by Zheng Jianfei [6774 0494 7236] of Beijing University of Agriculture and Zhang Zengfu [1728 1073 4395] of the Meteorological Bureau of Langfang Region: "Indexing and Division of Hot Dry Winds in Langfang Region"]

[Text] One of the chief agroclimatic problems encountered in Langfang [1671 0972] Region, Hebei Province in the late growth period of wheat is the occurrence of dry hot windy weather during the filling stage, which causes wheat to grow sharp stalks, yellow leaves and dead ripe or half-filled grains. In mild cases, the yield drops 10 percent, while in serious cases, the yield suffers as much as 20-30 percent reduction. According to surveys, owing to the discrepancy in geographical position, soil, and production level, when the region is hit by dry hot winds, the degree of wheat damage varies greatly among the three tracts of land covering nine counties* throughout the region. This article will only present some views on the indexing and division of dry hot winds.

I. Classification of Dry Hot Wind Weather

Dry hot winds in the Langfang Region fall chiefly into the following two categories:

1. High Temperature Dry Type--This is the major type of weather which affects wheat yield in this region. During the wheat blooming and filling period, if the hot and dry weather persists several days in a row, wheat often becomes immaturely dry from excessive heat, causing the stems and leaves to wither, the wheat awns to burst, and the kernels to become dry and empty. On 9 June 1975, when the the maximum air temperature in Xianghe County reached 35.8 degrees Centigrade and remained at that level for 4 consecutive hours, the Nongda 139 variety matured 5 to 6 days in advance,

* The northern tract includes Sanhe [0005 3109], Dachang [1129 1681] and Xianghe [7449 3109] counties, which have relatively good loamy soil, water and fertility conditions. The middle tract includes Anci [1344 2945], Yongqing [3057 3237] and Gu'an [9042 1344], of which a certain area is sandy land formerly flooded by the Yongding River. The southern tract includes Dacheng [1129 1004], Wenan [2429 1344] and Ba [8218] Counties, which cover almost . million mu of low-lying clay land.

and the 1000-grain weight dropped 5-7 grams as compared against 1974. In early June 1972, Ba County was hit by high temperature weather over 35 degrees Centigrade for 8 days, which caused a widespread yield drop of 20 percent among 7 communes in the great low-lying area.

2. Post-Rain Dead Ripe Type--Widely circulated in North China are such proverbs as "1 foot wheat fears 1 inch water," "water flowers but never water grains; watering grains makes roots expand and die." After the mid-milk stage, the root system activity of wheat crops with relatively poor growth begins to taper off. If rain falls at this particular time, soil permeability becomes relatively poor, and topsoil evaporation increases when the weather turns clear, thus causing the wheat to suddenly wither and die. In the low-lying area of the three southern counties of Langfang Region, wheat often becomes dead ripe after rain; in Dacheng and Wenan Counties, it occurs 7 or 8 times every 10 years. On 5-7 June 1979 there was heavy rain in the entire area, causing wheat in 6 southern counties to suffer widely from gray death (灰死).

II. Basis of Determining the Indices of Dry Hot Winds

Index values must bear a definite agricultural significance, and the values reflecting the indices of dry hot winds must show the physiology or morphology of wheat. To explain how the indices of dry hot winds are determined, following are some dry hot wind data obtained by observation in Ba County over the past 2 years.

1. Based on diurnal meteorological factors during xerothermal wind weather

Table 1

- (1) Time (year/month/day)
- (2) Growth Period
 - (a) formation of grain kernel
 - (b) early milk stage
 - (c) middle milk stage
- (3) Diurnal Mean Air Temperature
- (4) Diurnal Maximum Air Temperature
- (5) Hours
- (6) Hours
- (7) Relative Humidity at 1400
- (8) Wind Speed at 1400

From Table 1, it is evident that in 1976, the high temperature dry type xerothermal winds mainly occurred in the last 10 days of May, which was just before the filling period of wheat. The awns became dry, the top spikelets turned yellow. Moreover, the number of sterile flowers (不孕花) increased, and grain degeneration occurred. It was classified as light dry hot wind. On 5 June, there was heavy rainfall amounting to 80.4 mm. Large areas of wheat grown by production teams in the vicinity of the Agricultural Science Institute's own wheat field which had a level of

liquid fertilizer, the number of green leaves rapidly decreased. The xerothermal wind was classified as post-rain dead ripe type.

On 6 June 1977, the temperature was high, and it was a light xerothermal wind day. But on the 7th, the high temperature caused most of the awn varieties to suffer from awn bursting > 30 , and the crops in large fields became withering dry. It was classified as medium intensity xerothermal wind. On 9 June there was 12.5 mm of rainfall; after the rain, the days were hot and windy. There was widespread dead ripeness among the large fields. In high level liquid fertilizer wheat fields, the boot leaves and spikes rapidly yellowed and fell.

2. Based on the rate of defoliation and yellowing of boot leaves

Table 2. Rate of Boot Leaf Defoliation and Yellowing (percent)
(10 leaves on the average, Ba County in 1977)

- (1) Time (month/day)
- (2) Tangshan 6898
Beijing 15
- (3) Water and Fertility Conditions
- (4) high
medium

Anomalous changes during the dry hot windy days could be observed from the rate of boot leaf defoliation and yellowing. Table 2 clearly shows that prior to 5 June, the defoliation and yellowing of boot leaves occurred at normal rate. After 2 days of dry hot winds which set in on 6-7 June, the defoliation and yellowing of Tangshan 6898 variety rapidly accelerated, and the influence of high temperature factor was remarkable.

3. Based on grain filling rate

From the grain filling process, observations were made on how dry hot winds affected the termination of the filling climax. From Table 3, it can be seen that on 4 June, the samplings of Jingshuang No 2 and Tangshan 6898 varieties indicated a diurnal mean increase of 2.2-2.3 grams; but after the dry hot winds of the 6th and 7th, samplings showed a diurnal mean increase of 0.8-1.0 grams. On 7 June, the samplings of Beijing No. 16 and Taishan No. 1 indicated that the diurnal mean increase remained at 1.4-1.9 grams; but following the rain, the samplings dropped to 0.9-1.1 grams. The data in Table 3 shows that in 1977, high temperature dry type xerothermal wind weather and post-rain dead ripe type xerothermal wind weather caused the wheat filling climax period to shorten considerably, and also reduced the 1000-grain weight.

Table 3. Filling Process of Some Wheat Varieties (Ba County in 1977)

- (1) Variety
 - (a) Jingshuang No. 2
 - (b) Tangshan 6898
 - (c) Beijing 16
 - (d) Taishan No. 1
- (2) Item
 - (a) Filling Process (gram)
 - (b) Diurnal Increase (Gram/day)

(3) Sampling Date

4. Based on different growth periods

According to observations, resistance to xerothermal winds vary from the early filling period to the late filling period, which means that index values should likewise vary. Due to the fact that the physiological mechanism of wheat crops does not deteriorate in the early filling period, light dry hot winds do not affect the crops so easily; therefore, the index values should be higher. In the late filling period, the green portions of the plants basically defoliate and yellow when the physiological mechanism starts to weaken; the crops are easily damaged by xerothermal wind weather. Thus, the index values should be lower. Comparative study of Table 1 shows that at the high temperatures of 35 degrees Centigrade, the extent of damage varies in different growth periods.

III. Dry Hot Wind Index

Based on the preceding analysis, following is the scale of intensity during the xerothermal wind calamity period throughout the entire Langfang Region.

1. Early Filling Period (Flowering-Early Milk Period): May 15-25 in Wenan and Dacheng Counties; May 21-31 in other counties.

If the air temperature \geq 32 degrees Centigrade, and the wind holds 5 hours (auxiliary index: at 1400, the relative humidity \leq 35 percent, wind speed \geq 3m/s), it is classified as light xerothermal wind day.

If the air temperature \geq 35 degrees Centigrade and the wind holds 3 hours (auxiliary index: at 1400, relative humidity \leq 30 percent, wind speed \geq 3 m/s), it classified as medium xerothermal wind day.

2. Late Filling Period (Mid-Late Milk Period): May 26-June 5 in Wenan and Dacheng Counties; June 1-10 in other counties.

If the air temperature \geq 30 degrees Centigrade and the wind holds more than 5 hours, it is classified as weak xerothermal wind day (auxiliary index: at 1400, relative humidity \leq 35 percent, wind speed \geq 3 m/s).

If the air temperature ≥ 32 degrees Centigrade, and the wind holds over 5 hours, it is classified as medium xerothermal wind day (auxiliary index: at 1400, relative humidity ≤ 30 percent, wind speed ≥ 3 m/s).

Dry hot wind days are those days in which the high temperature and duration hours have reached their index values.

3. Post-Rain Dead Ripe Type Indices in the Mid-Late Milk Period: 26 May-5 June in Wenan and Dacheng; 1-10 June in Gu'an and Anci; 6-15 June in the three northern counties. During these periods, one rainfall alone can amount to over 7-10 mm; if the high temperature reaches ≥ 30 degrees Centigrade or the wind speed reaches ≥ 6 m/s within 2 or 3 days after the rain, those days are then classified as post-rain dead-ripe type xerothermal wind weather.

IV. Division of Xerothermal Wind Regions

1. Principle of division

(1) First, based on the gravity of xerothermal winds, in the various parts of the region, i.e. the frequency or number of times per year of which the post-rain dead ripe type and high temperature dry type xerothermal wind weather occurs in various places, the region can be divided into heavy, sub-heavy and light xerothermal wind zones.

(2) Based on the regionalization of light and heavy damaged areas hit by xerothermal winds, secondary subzones are further regionalized in a secondary division process in accordance with soil distribution diversity (e.g. the clay zone in the great low-lying area, the sand zone previously flooded by the Yongding River, and other loamy soil zones), the degree of which ground surface water sources are guaranteed, and the distribution of deep and shallow underground water wells.

(3) Specific boundaries are revised by referring to the actual wheat production and degree of decrease in yield during xerothermal wind years in various parts of the region.

2. Brief description of the divisions

Based on the preceding principle of division, the entire region is divided into 3 xerothermal wind zones--heavy, sub-heavy and light, and 4 secondary subzones as shown in the attached map.

Map: Schematic map of xerothermal wind regionalization in Langfang Region

- | | |
|-------------|---------------|
| (1) Beijing | (6) Yongqing |
| (2) Xanhe | (7) Ba County |
| (3) Xianghe | (8) Wenan |
| (4) Anci | (9) Dacheng |
| (5) Gu'an | |

(1) The southern areas gravely affected by dry hot winds include the whole of Dacheng and Wenan Counties, as well as 7 communes in Dongdian's great low-lying area. In this region, post-rain dead ripe weather occurs almost every year. Moreover, the soil texture is mostly clay and alkaline; in spring, there is no ground surface water source; the well irrigation area amounts to only 30-40 percent, and it is totally a deep well region (approximately 200 meters). This region is further divided into:

Great low-lying post-rain dead ripe affected zone (Ia), which includes 5 communes in the southern and northern great depression land of Dacheng County, 8 communes in the Wenan Depression of Wenan County, and 7 communes in Dongdian of Ba County, covering nearly 1 million mu of wheat field. This area is not only hard hit by post-rain dead ripe type xerothermal winds, due to its low lying relief, the temperature during the late growth period of wheat is higher than non-great depression areas; moreover, on the average, high temperature dry type weather hits the area 3 times a year. The soil texture is sticky and heavy, and the water holding capacity is poor. Especially in spring drought years when plant growth is weak, pose rain dead ripe xerothermal wind weather often gives rise to forced ripening, causing the growth period to terminate ahead of time and seriously reducing the yields. But during wet spring years (precipitation in March-May is 80-100 mm), plant growth in this region is excellent. The growth periods are normal, and the yields are higher than the average years.

Post-rain dead ripe sub-heavy xerothermal winds in non-depression areas (Ib): Includes the non-great depression areas of Wenan and Dacheng Counties, which is also frequented by post rain dead ripe type weather, but the high temperature dry type xerothermal wind weather is slightly milder than zone Ia. In addition, the well irrigation area is somewhat greater than the great depression area, enabling a portion of the land in Wenan County to store some of the surface water in the ditches during winter and early spring; thus, the xerothermal winds are relatively less harmful. Although the number of high temperature days in Dacheng County's non-depression land is less than Wenan's non-depression area, it has the worst water source conditions, and the actual danger is greater.

(2) The central area hit by sub-heavy xerothermal wind includes the whole of Gu'an, Yongqing and Anci Counties, as well as 12 communes outside the great depression land of Ba County, which are all located in the central portion of the region. In this area, the frequency of high temperature xerothermal winds is the highest (slightly lower in Ba County), totalling 41-45 days in 12 years; the post-rain dead ripe type weather occurs once every 2 years. The soil texture is composed of large tracts of sandy earth. The surface water sources are relatively poor, and winter irrigation can only draw on the tail water (surplus water from the upper streams) in the northern parts of Anci and Gu'an. The eastern part of this region is a deep well area, while the western part is a shallow well area.

The zone which is relatively hard hit by high temperature dry type xerothermal winds (IIa) includes 12 communes in the Yongqing area formerly

flooded by Yongding River, most of the communes and brigades in Anci, and the eastern part of Ba County. This region is mostly composed of sandy land formulated by Yongding River inundations or ancient river beds, or sandy alkaline land; the soil has strong water permeability and weak capacity to hold water. The soil contains less than 0.5 percent organic substances. Basically, there is no surface water source, and there are not many motor-pumped wells (the deep wells are located in underground water areas); the irrigation conditions are poor. In dry spring year, wheat grows thin and feeble, and withers away early. High temperature xerothermal wind weather often gives rise to dead ripeness.

Average high temperature xerothermal wind zone (IIb): Basically includes the whole of Gu'an County, the western parts of Ba County and Yongqing, some of the communes in the northern part of Anci. This is a shallow water region in which well irrigation accounts for 88 percent of the area in Gu'an. Although the occurrence frequency of xerothermal winds is relatively high (except in Ba County), due to the excellent watering conditions, the plants have better resistance to dry hot winds, and are basically left unharmed.

(3) Relatively mild xerothermal wind zone in the north (III): Covers the entire area of the 3 northern counties; the high temperature xerothermal winds strike the area 2-2.5 times annually; post-rain dead ripe weather occurs once in every 2-3 years, the frequency of which is less than the central and southern regions. The primary guarantee for watering the wheat crops twice before winter and twice during the jointing stage in spring lies in the Chaobai River which runs through the 3 counties. Besides, as the pump well irrigation systems of the three counties Xianghe, Sanhe and Dacheng account for 74 percent, 51 percent and 46 percent of the area, they play a certain role in preventing xerothermal wind damages from occurring. But due to the influence of the topographical relief (north of Sanhe's Xingfu Canal and north of Xianghe County's Chaobai River), some of the communes and brigades in the area have difficulty in obtaining ground surface water, and in serious xerothermal wind years, these places also suffer from partial yield decreases.

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CSO: 4007

BRIEFS

COMMUNE YEAREND DISTRIBUTION—By 15 January, 148,119 production teams throughout Hubei completed the yearend distribution, accounting for 67.2 percent of the total number of production teams. In Xiangyang Prefecture, the prefectural CCP Committee held many meetings, demanding the numbers one and two persons in the counties and communes personally grasp distributions. At present, 19,217 production teams in the this prefecture have completed yearend distribution, accounting for 77.5 percent of the total number of production teams. By mid-January, 113.13 million yuan allocated throughout the province, provided an average of 3 yuan per person. In 1979, the province planned to recover 160 million yuan of overdrafts, but has now recovered 197 million yuan. [HK020641 Wuhan Hubei Provincial Service in Mandarin 1400 GMT 27 Jan 80 HK]

CSO: 4007

BRIEFS

COTTON CONFERENCE—The Henan Provincial CCP Committee and the Henan People's Government recently held a conference in Zhengzhou on cotton production with the participation of Dai Suli, secretary of the Henan Provincial CCP Committee and vice provincial governor, who also gave a speech. Wang Bingzhang, standing committee member of the Henan Provincial CCP Committee, presided over the conference. The participants conveyed the spirit of the national conference on cotton and seriously studied Vice Chairman Li Xiannian's speech at the national conference on cotton. They also concretely made plans for our province's cotton production tasks in 1980 and studied and formulated policies and measures for speeding up the development of cotton production. They pointed out that the party committees and government in the cotton producing areas must publicize the important political and economic significance of cotton production and the principles and policies for developing cotton production. [Zhengzhou Henan Provincial Service in Mandarin 1130 GMT 28 Jan 80 HK]

CSO: 4007

BRIEFS

RURAL YEAREND DISTRIBUTION—In the 10 years of the cultural revolution, the income of the commune members throughout Hubei increased by only 3 yuan. In 1979, a total of 3,750 million yuan were distributed to commune members throughout the province. This is an increase of 16.7 percent. The average income of each person is 100 yuan, an increase of 15 yuan over 1978. According to a recent statistic, 3,836 production teams throughout Hubei distributed an average of between 200 and 300 yuan to each person, while 297 production teams distributed an average of between 300 and 400 yuan, and nine production teams distributed 400 yuan. The proportion of poor production teams decreased from 8 percent of the total number of production teams in 1978 to 3 percent. [HK150703 Wuhan Hubei Provincial Service in Mandarin 1100 GMT 4 Feb 80 HK]

HUBEI CROPS—In the past 2 years, the peasants in Hubei have produced 3,700 million jin of grain and 1.9 million dan of edible oil. Summer grain increased by 3,200 million jin and summer edible oil by 1.85 million dan. To reap a new high level of agricultural production this year, it is necessary to firstly grasp summer grain production. At present, the summer-harvested crops including wheat and rape in the province were affected by drought at an earlier period. Most of the crops in the province at present are third category seedlings. It is necessary to adopt immediate measures to strengthen management and overcome the pessimistic view. Since the weather is now more favorable, in 10 days, the wheat will grow another branch leaf and rape will also grow some new leaves. [HK171342 Wuhan Hubei Provincial Service in Mandarin 1100 GMT 11 Jan 80 HK]

CSO: 4007

BRIEFS

LOCAL SUGAR OUTPUT--In 1979, the total output of local sugar throughout Hunan was 4,600 tons, an increase of 52 percent over 1978. This local sugar is popular in the countryside of Hunan, particularly in the eastern, southern, and western parts of Hunan. At present, a large quantity of local sugar is being supplied to the markets. [HK020641 Changsha Hunan Provincial Service in Mandarin 1100 GMT 29 Jan 80 HK]

RURAL ENTERPRISES--In 1979, output of 38 large and medium products of the commune and brigade enterprises in Hunan increased prominently with better quality. The output value throughout the year was 2,800 million yuan, earning a net profit of 490 million yuan. Both the output value and net profit were 14 percent higher than in 1978. By 1979, there were 123,400 varieties of commune and brigade enterprise products in the province which employed 2.96 million persons. Now some 90 percent of the commune enterprises and 60 percent of the brigade enterprises have adopted the management system of "five fixed, one reward," mobilizing the activism of the enterprises and the personnel of the enterprises. [HK090653 Changsha Hunan Provincial Service in Mandarin 2315 Jan 80 HK]

POOR PEASANTS SUBSIDIZED--Since the national civil administration work conference, Hunan has set up some 30 trial-points in subsidizing poor peasant households in Changoe, Yueyang, Yiyang, Xiangtan, Lianyuan, Chenzhou and Hengyang prefectures, Xiangxi Tujia-Miao Autonomous Prefecture and Changsha. The province has shown concern for their political economic and material situation and made proper production arrangements for the rural poor peasants households. After a year's hard work, more than 80 percent of these households have been helped to improve their livelihood. [HK090653 Changsha Hunan Provincial Service in Mandarin 2315 GMT 4 Feb 80 HK]

AGRICULTURAL TECHNOLOGY--The system to popularize agricultural technology at the country level and below in Hunan will begin the new system of the three-in-one combination of the country general station to popularize the agricultural technology, the county agricultural science institute and the country agricultural school. The system used in the past could not concentrate the use of manpower, material and finance, affecting the popularization of technology. [HK120947 Changsha Hunan Provincial Service in Mandarin 2315 GMT 2 Feb 80 HK]

CHEMICAL TO KILL TERMITES—Changsha, 6 Feb—A 25-year-old forestry worker, Qian Xinwu, of Zhuzhou county, Hunan Province, where termites pose a threat to forests, has invented a new fumigant that kills termites. Qian Xinwu, who went to work at a tree farm in 1974 after he graduated from middle school, spent time reading, and talking to scientists and peasants about the termite problem before he found the right chemical compound. He has been appointed vice-director of the Zhuzhou County institute of forest research. [Text] [Beijing XINHUA in English 0724 GMT 6 Feb 80 OW]

SCIENTIFIC FARMING ACHIEVEMENTS—Changsha, 15 Feb (XINHUA)—Cotton production in Hunan Province last year was up by 24.8 percent over that in 1978, along with good harvests of rice, tea, oranges and silk cocoons as well as a big increase in stock breeding. This was attributed to popularizing advanced technique in scientific farming. Hunan Province is an important agricultural area in central China. Agrotechnical training courses were offered last year to some 706,000 people at all levels in the province. At present, there are more than one million peasants doing agro-technical work in Hunan. In 1975, they developed a hybrid rice whose per-hectare yield in some parts of the province averaged 46 percent higher than the conventional rices. Today, one third of the paddy fields in the province is sown to the new variety. Total grain production in the province went up by 4.4 percent last year. Out of the 102 counties in the province, 72 have their own institutes of agricultural sciences with research centers set up in 93 percent of the people's communes. [Text] [OW151346 Beijing XINHUA in English 1235 GMT 15 Feb 80 OW]

CSO: 4020

NOTICE ISSUED ON IMPROPER USE OF SEEDS

OWO91010 Beijing XINHUA Domestic Service in Chinese 0157 GMT 8 Feb 80 OW

[Excerpts] Nanjing, 8 Feb--The Jiangsu provincial people's government recently issued a notice to various localities throughout the province, that sternly dealt with two incidents resulting in serious decreases in production because of the indiscriminate use of seeds. It also demanded that the departments concerned assume financial responsibility and compensate for losses incurred by various communes and brigades.

Last September Jinhu and Feng counties reported to the province that the quality of a batch of hybrid paddy rice seeds acquired from Jiangdu and Danyang counties was of a poor quality, thus causing serious decreases in production. They demanded that the counties assume financial responsibility and the losses of various communes and brigades be compensated for.

The provincial bureau of agriculture and forestry organized agro-scientists and technicians to join the comrades of the local agricultural departments in listening to the views from peoples of all fields, conscientiously conduct investigations and discover the reasons for the incidents.

Because of these two incidents, the Jiangsu provincial people's government issued a special notice demanding that the seed departments in Jiangdu and Danyang counties return the money paid for the seeds and that the economic losses incurred by a number of communes and brigades in Jinhu and Feng counties be compensated for. It instructed that funds for this purpose were to be drawn from local relief funds.

In order to avoid the recurrence of similar incidents, the Jiangsu provincial people's government notice reaffirmed that in promoting the use of high-quality seeds, it is necessary to persistently carry out the policy of adopting an active but prudent attitude and to conscientiously practice the procedure that we must first sow the seeds on a trial basis, demonstrate the use of such is and then breed them. It is essential to adhere to the principle of introducing less but breeding more seeds. In breeding seeds, efforts must be made to check seed quality and to strictly forbid anyone from palming off inferior seeds as good ones.

The notice emphatically pointed out that from now on, those who have caused economic losses because of the indiscriminate use of seeds, the palming off of inferior seeds as good ones and dereliction of duty in testing seeds should be held responsible for the losses. Those involved in serious cases should be punished.

CSO: 4007

BRIEFS

INCREASE COTTON OUTPUT--Jiangsu Province has had bumper cotton harvests for 2 years running. Will it have another one or will it be even greater this year? This was the central topic of discussion at a provincial cotton production conference held recently in Nanjing. A host of facts presented at the conference show that Jiangsu still has tremendous potential to further increase cotton output. Comrades at the conference expressed their determination to advance Jiangsu's cotton output to a new level in the 1980s in order to make further contributions to the Four Modernizations. Comrades Zhou Ze, Xu Fangheng and Chen Ketain attended the conference. Comrade Zhou Ze made a speech. It was stressed at the conference that a solid foundation for an increase in cotton output should be laid this year, the first year of the 1980s. Comrades present held that Jiangsu's potential for cotton output increase has by no means been exhausted. On the contrary, much remains to be tapped. Therefore, the conference called on those areas which had had a record cotton output last year to maintain or surpass that record and those areas which had not reached their previous best record to strive harder to reach or surpass it. [Excerpts] [OW130121 Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 12 Feb 80 OW]

COUNTY COLD WEATHER--In the past 2 days, Ganyu county in Jiangsu has been hit by a snowstorm. The temperatures have dropped to about 13 degrees below zero, rivers and lakes are frozen. The county has held a telephone conference of commune party members, brigade cadres and production team leaders in an effort to arouse the cadres and masses to take preventive measures against the cold weather. [Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 1 Feb 80 OW]

LAND RECLAMATION--Nanjing, 8 Feb--Departments under the Jiangsu Provincial and Reclamation Bureau earned 24.98 million yuan profit in 1979, about an 8-fold increase over 1978. Forty-four of the 48 units under the bureau fulfilled or overfulfilled their financial revenue targets. Farms under the bureau overfulfilled the profit plan by 12.28 million yuan, of which 5.5 million yuan was turned over to the state, 1.23 million yuan was retained at the grassroots level and 4.3 million yuan was given to staff members and workers as bonuses. [Beijing XI 99 A Domestic Service in Chinese 0131 GMT 8 Feb 80 OW]

BRIEFS

ANIMAL HUSBANDRY--By the end of December 1979, there were 10 million pigs in Jiangxi, an increase of 5.9 percent over 1978. There were also 2.15 million head of cattle, an increase of 2.4 percent over 1978. During the same period, there were 80,000 goats and sheep. This is an increase of 14 percent over 1978. The number of domestic animals reached 0.5 million head, an increase of 10 percent over 1978, while the number of poultry reached 35 million head, an increase of 17.3 percent over 1978. Output of honey was 5.5 million jin, an increase of 3 percent over 1978. In 1979, 3,745,000 pigs were purchased throughout Jiangxi, overfulfilling the purchase plans by 5.6 percent. This is an increase of 12 percent over 1978. The quantity of fresh eggs purchased was 24.61 million jin, an increase of 100 percent over 1978. [Nanchang Jiangxi Provincial Service in Mandarin 1100 GMT 24 Jan 80 HK]

AFFORESTATION CONFERENCE--On the evening of 23 January, the Jiangxi people's government held a telephone conference on afforestation throughout the province, calling on the people to whip up an upsurge in afforestation and resolutely fulfill this year's plans on afforestation. Xu Qin, standing committee member of the Jiangxi Provincial CCP Committee and vice provincial governor, presided over the conference, and Zhang Guozhen, vice provincial governor, gave a speech. The participants revealed that by 16 January, 11.44 million mu in Jiangxi had been planted with trees, accounting for 48 percent of the year's plans. Ganzhou, Shangrao, Yichun and Jiujiang prefectures and Nanchang municipality, held conferences on afforestation last autumn and winter and made plans for afforestation. In Ganzhou Prefecture, 330,000 mu of land have been built for planting trees. Due to the recent rainfall in the province, many counties and municipalities are organizing labor forces to strive to fulfill this year's afforestation tasks. However, progress in afforestation in the province this year is still very slow. The participants pledged to plant trees on 10 million mu in the coming 3 years and on 3 million mu this year. [Nanchang Jiangxi Provincial Service in Mandarin 1100 GMT 24 Jan 80 HK]

FOREST TRACTS--Nanchang, 4 Feb--Since 1966 Jiangxi has developed commune- and brigade-run forest tracts. Currently the province has 8,559 forest tracts run by communes and brigades with 110,000 full-time workers. More than 6.2 million mu have been conserved for afforestation. Over the past dozen years, Xingan County has run 203 forest tracts with 2,100 full-time workers. [OWO51017 Beijing Xinhua Domestic Service in Chinese 0213 GMT 4 Feb 80 OW]

JILIN

BRIEFS

JILIN GRAIN OUTPUT--Changchun, 23 Jan--Last year the eight counties of Yushu, Huaide, Nongan, Fuyu, Dehui, Lishu, Jiutai and Yitong on Jilin Province's central plain produced a total of 8.7 billion jin of grain and delivered 3.3 billion jin of commercial grain to the state. The average per capita income of the area's 5.6 million agricultural population was 134 yuan last year. About a third of the province's population is located in this area and tills over 40 percent of the province's total farmland. [Beijing XINHUA Domestic Service in Chinese 0220 GMT 23 Jan 80 OW]

JILIN PRODUCTION BRIGADES--Changchun, 22 Jan--Last year, 1,374 poverty-stricken production brigades in Changchun Prefecture [first mention of such prefecture], Jilin Province, succeeded in increasing their production and incomes. Their number accounted for 82 percent of the prefecture's poverty-stricken production brigades. Compared with 1978, these production brigades increased agricultural production by 10 to 50 percent. At the same time, per capita income at most of the brigades increased by 50 percent. Changchun Prefecture, an important grain-producing area in Jilin Province, is comprised of Yushu, Nongan, Jutai, Dehui and Shuangyang counties and the outskirts of Changchun Municipality. [Beijing XINHUA Domestic Service in Chinese 1132 GMT 22 Jan 80 OW]

CSO: 4007

BRIEFS

FARM PRODUCTS INCREASED--Bigger supplies of meat and a good harvest are among the achievements reflected in official figures from China's most industrialized province, Liaoning, for 1979. For the first time in many years, more consumer goods are coming on to the market. Meat rationing has been cancelled, and pork is being sold at state-owned shops and rural fairs at about the same price. Vegetable supplies have been good all year, despite severe cold for 4 months, and many favorite local foods have reappeared. Eggs, poultry, fish and fruit are more than before. A good harvest was brought in despite water-logging, drought and cold weather and the estimated grain harvest was 10.9 million tons. Per capital income for the rural areas increased by 14 percent to 104 yuan. [Beijing XINHUA in English 0820 GMT 5 Feb 80 OW]

CSO: 4020

QINGHAI

BRIEFS

ANIMAL HUSBANDRY--Qinghai Province has readjusted plans for the development of agriculture and animal husbandry so as to achieve a proper balance between them. At present, 386,000 mu of cropland have been turned into base areas to grow fodder grass for pastoral production. [OW141121 Xining Qinghai Provincial Service in Mandarin 1100 GMT 9 Feb 80 OW]

CSO: 4007

BRIEFS

DECISION ON REWARDS--On 18 January, the Shaanxi provincial people's government made a decision on rewarding advanced collectives and advanced producers on the agriculture front. The provincial people's government has called on the cadres and commune members to emancipate their minds, start up the machinery, seek truth from facts, take the advanced collectives and advanced producers as their example, embark on the Four Modernizations, actively improve their knowledge of scientific management and scientific farming and speed up agricultural development. [HK270817 Xian Shaanxi Provincial Service in Mandarin 1100 GMT 21 Jan 80 HK]

AGRICULTURAL TAX EXEMPTION--In 1979, the finance departments at all levels in Shaanxi exempted the agricultural tax from one-third of the poverty-stricken production teams throughout the province. The economic conditions in these teams were relatively backward. At present, the tasks of investigating those who can be exempted from agricultural tax has been basically completed. According to statistics, 48,600 production teams throughout the province can be exempted from tax, accounting for 33.9 percent of the total number of basic accounting units. In Yulin Prefecture, 59.8 percent of the production teams were exempted from agricultural tax. In Dingbian County, 1,246 out of 1,510 production teams throughout the county were exempted from agricultural tax. [Xian Shaanxi Provincial Service in Mandarin 1100 GMT 12 Jan 80 HK]

COTTON CONFERENCE--Jiang Yi, deputy Shaanxi provincial governor, pointed out on 13 January at a provincial conference on cotton production that it is necessary to implement policy, relentlessly grasp the key measures and work hard at increasing the unit output. This is the principle of our province's cotton production during the readjustment period. In accordance with the spirit of the national conference on cotton production, the participants to the conference discussed and analyzed cotton production in our province and formulated the tasks of cotton production in 1980 and readjustment of the cotton farmland in the coming 2 years. During readjustment, the area of cotton farmland throughout the province will remain at 4 million mu. The various areas must transform the situation of the scattered layout of the cotton farmland in insufficient areas and too much arid and poor land. In 1980, the central authorities provided the province with 200 million jin of supplementary grain for cotton farmland, and 20,000 tons of urea. [Xian Shaanxi Provincial Service in Mandarin 1100 GMT 15 Jan 80 HK]

SHANDONG PAPER CALLS FOR GOOD WHEATFIELD MANAGEMENT

SK190716 Jinan Shandong Provincial Service in Mandarin 2300 GMT 18 Feb 80 SK

[Report on DAZHONG RIBAO 19 February editorial: "Make Every Effort To Strengthen Wheatfield Management"]

[Excerpts] The editorial states: With the passing of winter and the advent of spring, now is the time for us to attend to our wheatfields.

Wheat is one of the major grain crops in our province, with its output accounting for more than 40 percent of the total grain production. Experience over the past years shows that the output of wheat not only directly concerns our annual agricultural production but also affects the general situation of the national economy. Now is the second year of the readjustment of the national economy, and our success or failure in agricultural production will have a vital bearing on this economic readjustment. Because of this, we should look on wheatfield management as an important task from the viewpoint of implementing the readjustment policy by speeding up agricultural development.

What merits our attention at present is the lack of precipitation for some 2 months since the wheat was sown last fall. This, coupled with the earlier-than-usual arrival of the cold front, badly affected wheat growth during the pre-winter period. In many fields the seedlings are not as good as in previous years. Confronted with this situation, some of our cadres and commune members lack confidence in winning a rich wheat harvest. Some even think that a decline in production will be inevitable, and that there is no way to change it. This pessimistic attitude must be done away with. Since there are still nearly 4 months before the wheat-harvest season, we can do a lot of work on field management. Experience in wheatfield management has been gained previously in various localities. Such experience should be conscientiously summed up and popularized on a wide scale.

The editorial continues: We should take early and strenuous action to strengthen wheatfield management in spring. The scarcity of precipitation experienced last winter will not be relieved this spring, according to the

weather department's forecast. This presents a big problem in winning a bumper wheat harvest. It is imperative to start our work immediately to combat and guard against drought.

The editorial concludes: Now an excellent situation prevails in the countryside. The time has arrived for us to begin working for the first bumper harvest in the 1980's. It is hoped that an emulation drive will be launched in all localities toward winning a good wheat harvest and making our spring farming a success. Let us see at what localities the masses are well mobilized and new progress is made in strengthening field management so as to increase this year's wheat production to a great extent.

CSO: 4007

BRIEFS

SHANDONG PEASANT HOMES--Jinan, 21 Jan--Comfortable peasants' homes built in Jiaonan County in Shandong Province impressed delegates attending a recent conference on rural housing construction. So far 110,000 peasant families with 600,000 people have moved into new homes, accounting for three-fourths of the total number of peasant families in the country. The new housing averages more than 10 square meters of floor space per capita. The county stipulated that all the new houses belonged to the families that paid for it; those houses built by production brigades would be rented to the peasants, and that the trees grown in and around the family courtyards belonged to the growers. Shops, clinics and primary schools sprang up in the new villages. The better-off brigades have installed running water pipes for peasant families. The peasants proudly call their villages "our new socialist village." [OW211515 Beijing XINHUA in English 0707 GMT 21 Jan 80 OW]

CS0: 4007

BRIEFS

FOOD EXHIBITION—Shanghai, 12 Feb--A poll sponsored by a food exhibition here showed that chocolate wafers, peanut nougats, peanut crisps, egg rolls, Shanghai dark beer and "gold anchor" cigarettes with jasmine scent have become new favorites among local residents. The exhibition is run jointly by 19 local confectioneries, bakeries, canning and cigarette factories for the spring festival which starts Saturday. Each day the exhibition has been selling 12 tons of candies, more than one ton of chocolates, one and a half tons of biscuits and over 12,000 bottles of beer. One fourth of the 400 kinds of food and drinks on exhibit are new products this year. Because it is a custom for young couples to marry during the spring festival, the exhibition is offering ten kinds of candies in colorful wrappings printed with the word "happiness". The manager of the Shanghai Food Industry Company said that Shanghai now produces 700 kinds of candies and chocolates, and 200 varieties of biscuits. Last year 55,800 tons of candies and chocolates and 28,000 tons of biscuits were made. [Beijing XINHUA in English 0716 GMT 12 Feb 80 OW]

CSO: 4020

GRAIN PRODUCTION INCREASED BY 10 BILLION JIN

Beijing RENMIN RIBAO in Chinese 23 Nov 79 p 2

[Article by Wang Canhang [3769 3927 2635], Cao Qingnong [2360 1987 6597], Jiao Shichun [3542 0013 4783], and Zhang Meiting [1728 5019 1250] of the Grain Production Bureau of the Ministry of Agriculture: "A Survey of Increased Grain Production of 10 Billion Jin For 2 Years in Sichuan Province Through the Guiding of Agriculture On the Basis of Existing Conditions"]

[Text] Once the "gang of four" was smashed, Sichuan Province rapidly reversed the unstable and declining situation that had long endured in agricultural production to bring about sustained production and a very good situation of across-the-board bumper harvests. In 1977 total grain production amounted to 55 billion jin, an increase of 5.3 billion jin over 1976 and an increase of 4.5 billion jin over the record yields of 1975. Victory over a serious drought in 1978 brought about an increase of 5 billion jin over the bumper harvest of the year before. Increased production for the 2-year period amounted to 10.3 billion jin for an increase over 1976 of 20.7 percent, with an increase in per mu yields of 60 jin or 18 percent to make Sichuan the province with the highest rate of production increase in the nation in a single year. This year, party committees at all levels are conscientiously and thoroughly putting into practice the two Central Committee documents pertaining to agricultural growth; they have further aroused the enthusiasm of the broad masses of cadres and the masses to triumph over serious drought and low temperatures to improve the situation in agriculture. The forecast for total grain production for the entire year is for an increase of between 1.5 and 2 billion jin.

Why has Sichuan Province been able to increase grain production by 10 billion jin over the past 2 years? The reason is inseparable from the extirpation in party committees at all levels of the pernicious influence of the extreme left line of Lin Biao and the "gang of four," the conscientious implementation of various rural policies, changed work style, taking account of local natural climatic conditions and existing production conditions, and the guiding of agricultural production by fitting methods to local conditions.

In order to transform the backward appearance of agriculture in Sichuan, the principal officers in charge in the provincial committee conducted large scale investigation and study of production conditions and the natural climate. While emphasizing the need to conscientiously and fully apply the line, programs, and policies for increased growth in agriculture, they also paid attention to study of natural laws, and formulated strict production techniques and measures on the basis of climatic conditions and existing production conditions, neglecting not a single element in increased production. The fine work style of leading comrades from the provincial committee served as a model for the prefectural and county committees. Investigation and study on the part of cadres at all levels became the order of the day with an intensive search for major contradictions in production, taking account of conditions as they exist, coordinating methods to local conditions, and giving guidance in manageable amounts at a single time. In order to better understand the reasons for the rapid revival and growth of agricultural production in Sichuan, we journeyed to Wenjiang, Dayi, Renshou, Guangan, Baxian, and Dazu, counties in which increases in production had been quite substantial, to investigate and make inquiries, to hold informal discussions with county and commune cadres, and to summarize the key measures taken for the revival and acceleration of agricultural growth as follows:

1. In order to ward off calamities and strive for bumper harvests, the adoption of a series of active measures centering on adjustment of crop distribution so as to maximize advantages and avoid disadvantages. Full use of beneficial climatic conditions with avoidance of the harmful effects of disastrous weather. Principal adjustments were in the following four areas:

- a. Expansion of the late autumn crop area. Use of the abundantly beneficial heat conditions of winter and spring; improvements to winter wet fields; use of fallow fields in winter; vigorous efforts to develop production during late autumn; and increase in the amount of double cropping. Northern Sichuan has the protective screen of the Qinling and Daba mountains, so cold air currents are moderated and winter temperatures are 2 to 4 degrees higher than in the middle and lower reaches of the Yangtze River, which is beneficial for the growing of wheat and the wintering over of rape. Rainfall during the spring season is less than in the middle and lower reaches of the Yangtze, which is also beneficial for the ripening and harvesting of wheat and rape. Cultivation of wheat and rape brings rather high and stable yields. The provincial committee analyzed the advantageous circumstance of plentiful heat during winter and spring in Sichuan Province and decided that "late autumn was not too late, and that it was filled with potential," so they stressed the planting of dry crops in wet fields in those places where water supplies were adequate to bring about an increase in late autumn crops. By changing the use of wet fields in winter and by using otherwise fallow land during winter throughout the province, over a 2-year period late autumn grain was expanded across 4.5 million mu, and rape across 500,000 mu for an increased production of late autumn grain amounting to 2.7 billion jin, and an increase in rape seed amounting to more than 3.3 million dan, which was an increase over 1976 of 28 percent for wheat and 60 percent for rape seed.

After the paddy rice situation was straightened out, middle-season rice was attacked. Cumulative temperature for the entire year in the Sichuan Basin is in excess of 5000 degrees, which is between 500 and 1000 degrees more than for the lower reaches of the Yangtze River. The frost-free period is also longer by 2 months. From the standpoint of aggregate heat, cultivation of two crops of rice is possible. The main problem is uneven distribution of heat, particularly after September when the outdoor temperatures decline rapidly, autumn rains are copious, and the sun rarely shines, all of which have great bearing on the flowering and fruiting of paddy rice. When problems with water and fertilizer supply are added to this, a lot of skill is required to bring in a crop, and consequently double-crop late rice yields have been for a long time neither high nor consistent. On the other hand, middle season rice has good conditions in terms of growing period, temperature, and sunlight, so yields are both consistent and high. Because climatic characteristics were inadequately understood in the past, there was a lopsided emphasis on the development of double-crop rice rather than on middle season rice. In 1977, the provincial committee analyzed climatic characteristics and summarized the lessons of past experience to propose unequivocally a program to attack middle season rice and, suiting methods to local conditions, develop double-crop rice that straightened out the distribution of paddy rice. During the past 2 years, the area planted to double-crop rice has declined by more than 8 million mu and the area planted to middle season rice has increased by 2 million mu. Though the total area of cultivation of paddy rice has declined by 6.7 million mu, owing to great increases in per unit production of middle season rice, an increase in production amounting to 4.4 billion jin from middle season rice alone occurred during 1978. On top of this, corresponding increases in per unit yields of early and late rice following the straightening out process has brought a total increase of 6.2 billion jin that are attributable to increased per unit yields. Even with the elimination of an area that produced 3 billion jin, an increase of 3.2 billion jin took place.

3. Earlier planting of maize and sweet potatoes, using every possible means to avoid summer drought. Drought poses the greatest threat to agricultural production in Sichuan, and in eastern Sichuan drought plays particular havoc. As a means of avoiding summer drought, heavy emphasis was given to interplanting with maize being planted in spring rather than in summer and sweet potatoes being planted earlier than previously. In 1976 only 2 million mu of maize was planted in the springtime throughout the entire province, but in 1978 this was expanded to more than 12 million mu. Last year seven prefectures in eastern Sichuan sustained 60 days of severe summer drought, but thanks to the adoption of this measure, a majority of the places reaped increased yields.

4. Taking the overland route when the waterways are impassable. In the entire province there are between 4 and 5 million mu of non-irrigated or highly banked fields that cannot be irrigated and so each year must await rainfall before being planted to middle season rice. Yields from these fields are low and uncertain amounting to between 300 and 400 jin per good mu. During the past 2 years the provincial committee has adopted rigorous

measures requiring every region to plant dry field crops in these fields until such time as improvements have been made in water conservancy conditions. By planting wheat, maize, and potatoes in three crops each year, per mu yields have reached between 800 and 900 jin, double the yields from a crop of middle season rice.

Making full use of scientific farming. The increased per unit yields that have been realized in Sichuan during the past 2 years are directly attributable to vigorous pursuit of a campaign of scientific farming in which outstanding results have been obtained particularly in the expanded use of superior varieties and improvements in cultivation techniques. Prior to 1976 low yield varieties of all kinds of crops were the rule, but during the past 2 years with the universal use of short stemmed superior varieties of paddy rice and the expansion of hybrid rice to more than 7 million mu, per mu yields have increased by 200 jin over conventional rice. Hybrid maize now occupies half the area planted to maize, and per mu yields average 3 times those of old varieties. With the popularization of high yield rust resistant superior varieties of wheat, per mu yields are also higher than for the former varieties. Great improvements have also taken place in the backward growing techniques for all crops, and this has also played an important role in raising per unit yields.

Vigorous development of chemical fertilizer production. In 1976, 2 million tons of chemical fertilizer were applied throughout the province for an average 40 jin per mu of cultivated land. In 1978, chemical fertilizer application abruptly increased to more than 3.8 million tons for an average 76 jin per mu of cultivated land or a 91 percent increase over 1976 and at a rate of increase that stood third nationwide. At the same time a great development took place in the accumulation of manure from hog raising and in accumulation of fertilizer from methane gas. This in turn provided the material conditions for adjustments to crop distribution and in realizing consistently high yields. In the three counties of Dayi, Guangan, and Dazu that we visited, grain production during the past 2 years has increased by about 30 percent while fertilizer application for the same period increased between 1.2 and 1.8 times.

Agricultural production in Sichuan Province has revived and developed very rapidly, but as far as fundamental changes in agricultural production conditions are concerned, it still has a long way to go. In particular there has been no good solution to "droughts, poor soil, and scant forests," which are problems that adversely affect consistently high yields in Sichuan agriculture. During the past several years as a result of the interference and destruction caused by Lin Biao and the "gang of four," as well as deficiencies in work performance, capital construction in agriculture has been wanting with the area of irrigated land amounting to less than one-half the total, which is lower than the national average; only slightly more than 20 percent of cultivated land produces consistently high yields with more than 40 percent of the land consisting of low yield fields; the reforestation rate is declining and runoff of soil and water

is serious with a very great increase in the frequency of drought. Consequently, accelerated water conservancy construction, vigorous efforts to improve low yield fields and increased plantings of trees to create forests are crucial in the further acceleration of the development of agriculture in Sichuan. If these crucial points can be taken fully in hand in the future, it will be possible to make further adjustments in crop distribution, to raise the level of scientific farming, and to make agricultural production climb even faster.

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CSO: 4007

BRIEFS

AGRICULTURAL ZONING--Sichuan's work of investigating agricultural mechanization zoning has been completed after it was started last September. Currently, the analysis of data is in progress, and planning and studies in provincial agricultural mechanization zoning are under way. The investigation is under the responsibility of the provincial agricultural bureau and has been implemented by the provincial agricultural mechanization research center. The investigation team, divided into different groups for paddy land in hilly areas, dry crops in hilly areas, valleys, mountains and pastureland, launched investigations and studies. They studied the orientation, key points and procedures of agricultural mechanization according to different circumstances. They gathered various valuable information, made relevant proposals and contributed to the province's agricultural mechanization. [Chengdu Sichuan Provincial in Mandarin 2310 GMT 25 Jan 80 HK]

AGRICULTURAL CAPITAL CONSTRUCTION--The province has scored remarkable results in carrying out agricultural capital construction. The province is densely populated while agricultural land is not adequate, and there are frequent droughts. Since winter began, many dry places have been vigorously grasping water conservancy work. According to statistics, in the past 2 months, 1,170 water conservancy projects which were under construction and would each hold less than 10 million cubic meters of water have been reviewed and reduced to only 261, of which 110 are guaranteed to be completed within this year. Many places also grasped afforestation as one of the main targets of agricultural capital construction. A professional force of 30,000 people has built 40,009 mu of farmland in hilly areas in Jianyang County. [HK010314 Chengdu Sichuan Provincial in Mandarin 2310 GMT 25 Jan 80 HK]

AFFORESTATION CONGRESS--The Sichuan congress of the young people's progressive collectives and individuals in afforestation and forestry protection was held in Chengdu from 19 to 25 January. The congress was jointly held by the Sichuan CYL committee and the Sichuan forestry bureau with the participation of 600 representatives. They discussed the major issue of speeding up afforestation throughout Sichuan. Yang Wanxuan, secretary of the Sichuan Provincial CCP Committee, gave a speech. Also present at the congress were Yang Rudai, (Zhang Lixing), (Yang Zhong) and (Wu Xihai), responsible comrades of the Sichuan Provincial CCP Committee and the provincial people's government. Yang Rudai also gave a speech. (Wang Shugui), director of the Sichuan forestry bureau, and (Wang Dongxin), deputy secretary of the Sichuan CYL Committee, made work reports. [Chengdu Sichuan Provincial Service in Mandarin 2310 GMT 26 Jan 80 HK]

BRIEFS

PEASANTS ASSOCIATION--The Xinjiang autonomous regional association of poor and lower-middle peasants held a work conference to convey the central authorities' documents concerning the work of the association and to discuss and formulate the tasks for 1980. Tomur Dawamat, secretary of the regional CCP committee, spoke at the meeting, attended by over 30 responsible persons of associations of poor and lower-middle peasants in various prefectures. The conference reviewed achievements by all-level associations of poor and lower-middle peasants in 1979 and, in formulating the tasks for 1980, called for protecting legitimate political rights and economic interests of the masses of peasants and herdsmen, listening to their opinions, mobilizing them to promote agriculture and animal husbandry, raising their socialist and communist awareness, launching agricultural and animal husbandry scientific experiments, strengthening the unity of all nationalities in order to consolidate the motherland's frontier and struggling against unhealthy social tendencies. [Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 7 Feb 80 OW]

CSO: 4007

BRIEFS

SPRING AFFORESTATION--The People's Government of Xizang Autonomous Region on 15 February issued a circular urging all localities to launch mass afforestation in spring. The circular called for still greater efforts to readjust the structure of forestry production so as to develop agriculture, forestry and animal husbandry in a coordinated way. The party policies on forestry should be implemented so as to promote mass afforestation and protect the ownership of trees planted by the collective or individuals. The circular also called on all localities to implement the forestry act adopted by the NPC Standing Committee and the State Council's notice on forest protection so that better results can be achieved in both management and protection of forests. [Lhasa Xizang Regional Service in Mandarin 1100 GMT 15 Feb 80 OW]

XIZANG FARM MACHINERY TRAINING--Lhasa, 30 Jan (XINHUA)--A two-month course on the use and maintenance of farm equipment has closed here. More than 40 cadres in charge of agricultural machinery in 35 counties and districts in Lhasa, Xigaze, Shannan and other prefectures attended it. [Text] [OW300754 Beijing XINHUA in English 0719 GMT 30 Jan 80 OW]

CSO: 4020

BRIEFS

YUNNAN PREFECTURE PIGS--The people in Zhaotong Prefecture have overfulfilled the tasks of purchasing and procuring pigs in 1979. According to statistics of the departments concerned, 260,000 pigs were purchased in 1979 throughout the prefecture, an increase of 4,300 head over 1978. During the same period, the prefecture also procured 150,000 pigs, overfulfilling the plans by 15 percent. [Kunming Yunnan Provincial Service in Mandarin 1100 GMT 27 Jan 80 HK]

CSO: 4007

ZHEJIANG VICE GOVERNOR ON FIRST BUMPER HARVEST IN 1980'S

OW172236 Hangzhou Zhejiang Provincial Service in Mandarin 1100 GMT 16 Feb 80 OW

[Talk by Yuan Fanglie, standing committee member of the Zhejiang Provincial CCP Committee and vice governor of provincial people's government: "Strive for the First Bumper Harvest Year in the 1980's"—recorded]

[Excerpts] The first spring festival of the 1980's is here. I wish you all a happy spring festival.

The situation on the agricultural front in Zhejiang is excellent. Our province has continuously reaped bumper harvests in the past 10 years. In 1978, Zhejiang's total grain output reached 28.4 billion jin, an increase of 4.7 billion jin. In 1979 the total grain output exceeded 30 billion jin. Over the past 2 years the total grain output has increased by an average of more than 13 percent each year. Such an increase is rare in the history of Zhejiang's agricultural development.

Last year, production of many industrial crops in Zhejiang increased by large margins. Total silkworm cocoon output reached 1.15 million dan, an all-time high since the founding of the country. The total rapeseed output reached 4.43 million dan, and the total output of oil-tea camellia seeds reached 750,000 dan. The output of tea leaves and tangerines was at an all-time high.

In 1980 we still must make great efforts to promote agriculture. First, we must seriously study Comrade Deng Xiaoping's important speech on the present situation and task. His speech incisively expounds the international and domestic situation and our task in the 1980's and is of important significance to our work in 1980 and in the decade as a whole. We must grasp the study of this important speech as a matter of prime importance at present.

Second, we must continue to study and publicize and conscientiously implement the party Central Committee's two documents on the question of agriculture. It is necessary to stabilize the three-level ownership by the commune, the production brigade and the production team with the latter as the basic accounting unit.

Third, we must open all avenues for production and strive hard to develop production.

The 1980's are decisive years in our march toward the four modernizations. We must make very good use of each day. We must develop the pioneering spirit of plain living and hard struggle and strive hard for the first bumper harvest year in the 1980's.

CSO: 4007

CULTIVATION OF NEW ZHEJIANG WHEAT VARIETY DISCUSSED

Hangzhou ZHEJIANG NONGYE KEXUE [ZHEJIANG AGRICULTURAL SCIENCES] in Chinese
No 5, 1 Oct 79 pp 18-21

[Article by Shi Jilin [0670 3444 2651] and Du Mane [2629 3341 1230] of the Zhejiang Provincial Agricultural Science Academy: "Exploring the Conditions of Cultivation of Surplus Yields of the Zhe Mai No 2 Wheat"]

[Text] Zhe Mai No 2 is a new variety of wheat successfully cultivated by the wheat crop laboratory of the Zhejiang Provincial Agricultural Science Academy. To fully develop the properties of surplus yield of the variety, it is necessary to study the means of cultivation by which high yields can be obtained. We conducted some experiments in this regard. As reference, the experimental results regarding the amount of fertilizers applied, the amount of seeds sown and the time of sowing are summarized below.

1. Methods of Experiment

This experiment was conducted in 1978-79 at the experimental fields of this academy. The experiment was designed as an orthoselection by multiple factors using the $L_9(3^3)$ table. Three factors, the amount of fertilization, the amount of seeds sown and the sowing time, were used. Each factor had 3 levels and 9 treatments (Table 1). The experiment was repeated 3 times in a small area of 1 li (0.666 square meters). Measurements showed the soil of the experimental field had a pH of 6.81, contained 3.54 percent of organic matter, 0.22 percent of whole nitrogen, 0.093 percent of whole phosphorus and 2.0 percent of whole potassium. During the course of the experiments, 30 jin of phosphorus and 30 jin of potassium per mu were added to each small area in addition to the amounts of fertilizers planned. The ratio of base manure to sidedressing whether the amount of fertilization was high or low was: 70 percent of base manure, 5 percent of fertilizers to cover the seeds, 15 percent of fertilizers for the seedlings during the three leaves period, and 10 percent of fertilizers during the waxy ripe stage. Each treatment included packing the soil once during the three leaves period and once during the four leaves period. Ye mai long was sprayed once during the two leaves period. Tuo bu jin was sprayed twice after heading. Outside of the experimental area, there were also a high fertility area and an area used as an auxiliary for the methods of fertilization. After the crops in each small area matured, all crops were harvested on May 28.

2. Results of Experiments

1. Table 1 shows that treatment method 8, a combination of sowing 20 jin of seeds on 1 November and applying 70 dan per mu of fertilizers, enabled zhe mai No 2 to produce the highest yield with an average per mu yield of 737.7 jin. It seems that this method of treatment can serve as reference for future production.

2. The effects of each factor upon the amount of yield within the limits designed by this experiment show that unit area yield of zhe mai No 2 increases as the amount of fertilization is increased, the amount of seeds sown is increased and as the seeds are sown earlier (Table 1, Table 2). Among these three factors, sowing the seeds earlier has the most visible effect upon the yield. The difference between the highest and the lowest yields was 70.6 jin per mu. The factor that produced the second most visible effect was the amount of fertilization. The difference between the two extremes was (R) 62.4. Of the 3 factors, the amount of seeds sown had the least effect upon yield. When the amount of seeds sown per mu was raised from 10 jin to 30 jin, per mu yield increased only by 30.2 jin. The remaining amount of increased yield after subtracting the amount of increase due to the increase in the number of seeds sown is indeed limited. Results of analysis of mean square errors (Table 3) show the values of F among the various sowing times and the various amounts of fertilization are all greater than the value of F at F 0.05. This indicates that the difference between these two factors of different levels is outstanding, while the difference due to the various amounts of seeds sown are not as obvious. The above shows that while emphasis should be placed on sowing the seeds earlier, appropriately increasing the amount of fertilization at the same time is an effective measure to enable zhe mai No 2 to produce a high yield.

3. Results recorded in Table 2 show that theoretically, the combination of applying 70 dan of fertilizers per mu, sowing on 1 November and sowing 30 jin of seeds per mu is most suitable for zhe mai No 2 to increase yield. However, this combination was not used in this experiment. Whether this combination is the best in actual practice still remains to be tested and proven. Since the difference among the various amounts of seeds sown in this experiment was not remarkably different, and since the absolute increase in yield due to raising the amount of seeds sown was very small, that before further experimental results are obtained, it is suggested that under general conceptions of production, the best combination as shown by this experiment should still be used, that is: applying 70 dan of fertilizers per mu, sowing 20 jin of seeds per mu and sowing on 1 November.

III. Discussion of Several Problems

1. Problem concerning the sowing time: Within the limits of the 3 sowing times set up by this experiment, zhe mai No 2 tends to produce more when it is sown earlier (Table 2). The reason may be because of the following:
(1) Sowing the seeds earlier enables the plants to produce more tillers before winter (before the end of December) and single plants have greater leaf surface area and dry weight (Table 4). Thus, strong and healthy seedlings

with stronger resistance to adversity can be grown for wintering. (2) Because there are more tillers before winter when the seeds are sown earlier, and the percentage of spikes formed from tillers before winter is high (Table 5), there are more spikes per unit area in the fields sown earlier. (3) The average number of leaves on a single stem of plants sown earlier is greater. Observations indicate that sowing 10 days earlier yields one more leaf. For example, the single stem of the plant sown on 1 November has 13 leaves while the single stems of plants sown on 10 November and 20 November have 12 and 11 leaves respectively. A greater number of leaves on the single stem increases the ability to supply nutrients for young spike differentiation and therefore the spikes are large and the grains are plenty. For example, plants sown on 1 November have an average of 32.1 grains per spike. Those sown on 10 November and 20 November have only 27.2 grains and 24 grains on each spike. It can be seen from the above that plants sown earlier have more spikes, larger spikes and more grains and therefore they can produce increased yields.

Table 1 Effect of the Various Experimental Treatments Upon the Yield of Zhe Mai No 2

| 1) 代 号 | 2) 处 理 内 容 | | | 6) 籽 实 产 量 (斤/亩) | | | |
|--------|------------|--------|----------|------------------|-----------|------------|-------|
| | 3) (担/亩) | 4) 斤/亩 | 5) (月/日) | 7) 重 复 I | 8) 重 复 II | 9) 重 复 III | 10) 均 |
| 1 | 30 | 10 | 11/1 | 694 | 556 | 696 | 648.7 |
| 2 | 30 | 20 | 11/10 | 635 | 660 | 636 | 643.7 |
| 3 | 30 | 30 | 11/20 | 617 | 614 | 627 | 619.3 |
| 4 | 50 | 10 | 11/10 | 699 | 657 | 630 | 662.0 |
| 5 | 50 | 20 | 11/20 | 653 | 614 | 597 | 621.3 |
| 6 | 50 | 30 | 11/1 | 733 | 686 | 714 | 711.0 |
| 7 | 70 | 10 | 11/20 | 653 | 606 | 676 | 645.0 |
| 8 | 70 | 20 | 11/1 | 708 | 769 | 736 | 737.7 |
| 9 | 70 | 30 | 11/10 | 706 | 725 | 717 | 716.0 |

11) 注: 每斤施肥担数, 系按标准肥折算而成。底肥均用羊粪肥加菜饼饼, 追行肥均用人粪尿干土, 追肥一律用硫酸铵。

Key:

1. Treatment number
2. Content of Treatment
3. Factor A: Amount of Fertilization (dan/mu)
4. Factor B: Amount of seeds sown (jin/mu)
5. Factor C: Sowing time (Month/day)
6. Yield of Grains and Fruit (jin/mu)
7. Repeat I
8. Repeat II
9. Repeat III
10. Average
11. The number of dan applied per mu is converted according to standard manure. All base manure includes sheep manure plus rapeseed cake. All the fertilizers for covering the seeds are a mixture of human waste and dry soil. All sidedressings are ammonium sulphate.

Table 2 Values of K of Each Factor Affecting Zhe Mai No 2 Wheat

| 1) 项目 | 2) 各因素的K值 | | |
|----------------|-----------------|-----------------|-----------------|
| | 3) 因素A (施肥量) | 4) 因素B (播种量) | 5) 因素C (播种期) |
| K ₁ | 1911.7 | 1955.7 | 2097.4 |
| K ₂ | 1994.3 | 2002.7 | 2021.7 |
| K ₃ | 2098.7 | 2066.3 | 1885.6 |
| \bar{K}_1 | 637.2 | 651.9 | 699.1 |
| \bar{K}_2 | 664.8 | 667.6 | 673.9 |
| \bar{K}_3 | 699.6 | 682.1 | 628.5 |
| 6) R(极差) | 62.4 | 30.2 | 70.6 |

Note: K₁ represents: 30 dan of fertilizers per mu, or 10 jin of seeds sown per mu or sown on 1 November.

K₂ represents: 50 dan of fertilizers per mu, or 20 jin of seeds sown per mu or sown on 10 November.

K₃ represents: 70 dan of fertilizers per mu, or 30 jin of seeds sown per mu or sown on 20 November.

Key:

1. Item
2. Values of K of Each Factor
3. Factor A (Amount of fertilization)
4. Factor B (Amount of seeds sown)
5. Factor C (Sowing time)
6. R(differences between the most and the least)

Table 3 Analysis of Mean Square Error of the Amount of Fertilization, Amount of Seeds Sown and Sowing Time Experiment of Zhe Mai No 2

| 1) 方差来源 | 2) 平方和 | 3) 自由度 | 4) 均方 | F |
|---------|---------|--------|--------|---------|
| 5) 施肥量 | 1887.6 | 2 | 943.8 | 22.011* |
| 6) 播种量 | 1350.9 | 2 | 675.5 | 7.391 |
| 7) 播种期 | 7768.3 | 2 | 3884.2 | 42.496* |
| 8) 误差 | 182.8 | 2 | 91.4 | |
| 9) 总和 | 15799.6 | 8 | | |

Remark: Check F Table, F_{0.05} = 19, F_{0.01} = 99.

Key:

- | | |
|-----------------------------------|-------------------------------|
| 1. Origin of mean square error | 6. In the amount of seed sown |
| 2. Squared sum | 7. In time of sowing |
| 3. Degree of freedom | 8. Error |
| 4. Mean square | 9. Total sum |
| 5. In the Amount of fertilization | |

Table 4 Effect of Different Sowing Times Upon the Growth of Zhe Mai No 2 Before Winter

| 1) 播种期 (月/日) | 2) 单株叶面积 (平方厘米) | 3) 干物重 (克/株) | 4) 分蘖数 (个/株) | 5) 根数 (条/株) |
|-----------------|--------------------|-----------------|-----------------|----------------|
| 11/1 | 29.2 | 0.20 | 3.24 | 10.2 |
| 11/10 | 19.5 | 0.15 | 2.24 | 9.6 |
| 11/20 | 10.4 | 0.07 | 0.40 | 6.3 |

Key:

1. Sowing Time
2. Leaf Area of Single Plant (centimeter²)
3. Dry weight (gram/plant)
4. Number of tillers (plant)
5. Number of roots (plant)

Remark: Numbers in table are measurements taken on 25 December

Table 5 Percentage of Spikes Formed From Tillers of Various Sowing Times of Zhe Mai No 2

| 1) 调查日期 (月/日) | 2) 项目 | 3) 第一次播种 (11/1) | 4) 第二次播种 (11/10) | 5) 第三次播种 (11/20) |
|------------------|----------|--------------------|---------------------|---------------------|
| 11/28 | 分蘖数(每方尺) | 3 | — | — |
| | 6) 分蘖成穗数 | 2 | — | — |
| | 分蘖成穗率(%) | 66.7 | — | — |
| 12/6 | 分蘖数(每方尺) | 14 | — | — |
| | 6) 分蘖成穗数 | 14 | — | — |
| | 分蘖成穗率(%) | 100.0 | — | — |
| 12/13 | 分蘖数(每方尺) | 24 | 27 | — |
| | 6) 分蘖成穗数 | 14 | 17 | — |
| | 分蘖成穗率(%) | 58.3 | 62.0 | — |
| 12/20 | 分蘖数(每方尺) | 23 | 33 | 1 |
| | 6) 分蘖成穗数 | 10 | 6 | 0 |
| | 分蘖成穗率(%) | 43.5 | 18.2 | 0.0 |
| 12/28 | 分蘖数(每方尺) | 21 | 30 | 3 |
| | 6) 分蘖成穗数 | 8 | 2 | 0 |
| | 分蘖成穗率(%) | 38.1 | 6.7 | 0.0 |

| | | | | |
|------|----------|------|-----|-----|
| 1/3 | 分蘖数(每方尺) | 36 | 42 | 38 |
| | 6) 分蘖成穗数 | 5 | 0 | 1 |
| | 分蘖成穗率(%) | 13.9 | 0.0 | 2.6 |
| 1/10 | 分蘖数(每方尺) | 50 | 45 | 59 |
| | 6) 分蘖成穗数 | 1 | 0 | 4 |
| | 分蘖成穗率(%) | 2.0 | 0.0 | 6.8 |
| 1/17 | 分蘖数(每方尺) | 25 | 33 | 19 |
| | 6) 分蘖成穗数 | 1 | 0 | 1 |
| | 分蘖成穗率(%) | 4.0 | 0.0 | 5.3 |
| 1/24 | 分蘖数(每方尺) | 17 | 16 | 54 |
| | 6) 分蘖成穗数 | 0 | 0 | 1 |
| | 分蘖成穗率(%) | 0.0 | 0.0 | 1.9 |
| 2/7 | 分蘖数(每方尺) | 5 | 14 | 36 |
| | 6) 分蘖成穗数 | 0 | 0 | 0 |
| | 分蘖成穗率(%) | 0.0 | 0.0 | 0.0 |
| 2/14 | 分蘖数(每方尺) | 0 | 0 | 3 |
| | 6) 分蘖成穗数 | 0 | 0 | 0 |
| | 分蘖成穗率(%) | 0 | 0 | 0.0 |

Key:

1. Date of measurement (month/day)
2. Item
3. First Sowing Time (11/1)
4. Second Sowing Time (11/10)
5. Third Sowing Time (11/20)
6. Number of tillers (per square chi)
Number of spikes formed from tillers
Percentage of spikes formed from tillers (%)

Table 6 The Effects of Different Amounts of Fertilization Upon the Economic Characteristics and Yield of Zhe Mai No 2

| 1) (担/亩) | 2) (%) | 3) (%) | 4) (万/亩) | 5) (粒/穗) | 6) (克) | 7) (斤/亩) |
|-------------|-----------|-----------|-------------|-------------|-----------|-------------|
| 30 | 131.1 | 12.6 | 35.99 | 26.8 | 34.42 | 637.2 |
| 50 | 171.4 | 14.8 | 38.77 | 27.8 | 33.13 | 664.8 |
| 70 | 195.2 | 18.2 | 42.29 | 29.4 | 33.10 | 693.4 |
| 90 | | | 32.5 | 27.2 | 27.82 | 595.5 |

Remark: Experiment involving the application of 90 dan of fertilizer per mu was conducted in the auxiliary experimental area.

Key:

1. Amount of fertilization
2. Percentage of tillering (%)
3. Percentage of formation of spikes from tillers (%)
4. Number of spikes (10,000/mu)
5. Number of grains per spike
6. Weight of thousand grains (gram)
7. Yield (jin/mu)

Table 7 Effect of Different Amounts of Seeds Sown Upon the Economic Characteristics of Zhe Mai No 2

| 1) (斤/亩) | 2) (%) | 3) (%) | 4) (%) | 5) (万/亩) | 6) (粒/穗) | 7) (克) |
|-------------|-----------|-----------|-----------|-------------|-------------|-----------|
| 10 | 92.4 | 309.1 | 79.7 | 72.5 | 31.3 | 33.87 |
| 20 | 79.0 | 191.4 | 37.9 | 42.6 | 27.5 | 33.85 |
| 30 | 72.7 | 115.5 | 17.3 | 42.3 | 25.2 | 32.95 |

Key:

1. Amount of seeds sown (jin/mu)
2. Percentage of formation of spikes on the main stem (%)
3. Percentage of tillering (%)
4. Percentage of formation of spikes from tillers (%)
5. Number of spikes (10,000/mu)
6. Number of grains per spike
7. Weight of thousand grains (gram)

In addition, sowing early also enables the plants to mature earlier. Let us take the case of applying 50 dan of fertilizers as an example: Plants sown on 1 November reach full heading on 8 April and mature on 23 May. Plants sown on 10 November reach full heading on 12 April and mature on 24 May. Plants sown on 20 November reach full heading on 16 April and mature on 26 May. Thus, to satisfy the need of the triple cropping system, early sowing should also be emphasized.

Because the earliest sowing time of this experiment was 1 November, and among all the various sowing times the one producing the highest yield was 1 November, the effect of sowing zhe mai No 2 even earlier upon the growth and yield cannot be obtained from this experiment and further experiment is required.

2. Problem concerned with the amount of fertilization: Within the range of the three levels of fertilization used in this experiment, the yield of zhe mai No 2 increases as the amount of fertilization increases. Study indicates the percentage of tillering, the percentage of spikes formed from tillers, the number of spikes per mu and the number of grains per spike all increase along with increases in the amount of fertilization. Although the thousand grain weight tends to decrease as the other properties increase, this is insufficient to reverse the results of increased yield produced by increasing fertilization and formed together by the increase in the number of spikes per mu and the number of grains per spike. Therefore, within this range of fertilization, increasing fertilization can produce increased yield (Table 6). As to the question concerning the effect of further increasing the amount of fertilization upon the yield, we have conducted an auxiliary experiment simultaneously with this experiment. The results of the auxiliary experiment shows that when the amount of fertilizers applied per mu is increased to 80 dan, the stems of zhe mai No 2 becomes soft, leaves droop seriously, lodging occurs before heading. The number of spikes per unit area, the number of grains per spike and the weight of grains, the three factors that constitute yield, visibly worsen and the yield thus visibly drops (Table 6). In the experimental areas in which 70 dan per mu of fertilizers were applied, plants covering one half of the total area lodged 25 to 30 days after heading. It can be seen from the above that the amount of fertilization for zhe mai No 2 under ordinary conditions should be held to between 60 and 70 dan/mu. Further studies are still needed in regard to changing the method of application of fertilization such as changing the ratio of base manure to sidedressing to increase the amount of fertilization and thus further improve the growth and raise the yield.

3. Problem concerned with the amount of sowing: According to our observations, within the limits of our experiment, the percentage of spikes formed on the main stem and the percentage of spikes formed from tillers of zhe mai No 2 both decrease as the amount of seeds sown increases. Therefore the increase in the number of effective spikes in a unit area cannot increase in proportion to the amount of seeds sown. When the amount of seeds sown surpasses a certain level, the number of spikes in a unit area does not increase further. The number of grains on each spike decreases as the amount of seeds sown increases. To a certain degree, the thousand grain weight also decreases as the amount of seeds sown increases (Table 7). Everyone knows that yield consists of the number of spikes in a unit area, the number of grains on each spike and the weight of grains. Under ordinary conditions, increasing the amount of sowing can strengthen some factors that make up the yield but some other factors that make up the yield are weakened. This is exactly why the differences in the yields of the three different amounts of seeds sown in our experiment were not obvious. Thus, the yield resulting from this experiment does not reveal which amount is best. Yet, Table 7 shows when the amount

of seeds sown increased from 10 jin/mu to 20 jin/mu, the number of spikes per mu increases more and the thousand grain weight drops very little. But when the amount of seeds sown increases from 20 jin/mu to 30 jin/mu, the number of spikes per mu, the number of grains per spike and the weight of grains were all less satisfactory than those resulting from sowing of 20 jin/mu of seeds. If only economic characteristics are taken into consideration, then of the three amounts of seeds sown, it seems 20 jin/mu is better. Further experiments must be conducted to see if the amount of seeds sown could be increased when the plants are sown late or when less fertilizers are applied, and conversely, to see if the amount of seeds sown can be appropriately reduced when the seeds are sown early or when the level of fertility is high since this experiment lacks a clear comparison for such determination.

IV. Conclusion

1. According to experimental results obtained in the experimental fields of this academy in Hangzhou, the best combination of the amount of fertilization, amount of sowing and time of sowing for zhe mai No 2 wheat is: to sow the seeds on 1 November, to apply 70 dan of fertilizers and to sow 20 jin of seeds per mu. Theoretical calculations show if the above sowing time (1 November) and the amount of fertilization (70 dan) can be sustained, then better results might be obtained if 30 jin of seeds are sown per mu. However, this combination was lacking in the experiment and further tests and proof are needed.

2. Among the three factors in this experiment, the amount of fertilization, the time of sowing and the amounts of seeds sown, the time of sowing exerts the greatest effect upon the yield of zhe mai No 2, followed by the amount of fertilization. The earlier the seeds are sown or when more fertilizers are applied, the more ideal the economic characteristics of zhe mai No 2 and the higher the yield. Measurements of the values of F show that differences in the sowing time and differences in the amount of fertilization can result in a 5 percent visible difference in the result. The amount of seeds sown has little effect upon the zhe mai No 2 and the difference in the result is not greater than the 0.05 point for differentiability. It can be seen from this that for zhe mai No 2 to produce surplus yields, early sowing and increasing the amount of fertilization should be particularly emphasized.

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CSO: 4007

REVIEW, PROSPECTS FOR WHEAT BREEDING IN ZHEJIANG

Hangzhou ZHEJIANG NONGYE KEXUE [ZHEJIANG AGRICULTURAL SCIENCES] in Chinese No 5, 1 Oct 79, pp 14-17

[Article by Luo Shuzhong (5012 2885 0022) of the Crop Research Institute of the Zhejiang Provincial Agricultural Science Academy]

[Text] Before Liberation, the average per mu yield of our province's wheat was only several dozen jin. After Liberation, the unit area yield continually increased and by 1979, the average per mu yield reached 359 jin. The increase in unit area yield of wheat year after year was closely related technically to emphasis on basic construction of farmlands, improvement of conditions of fertilization and the movement to push forward high standards of field management. In addition, the selective use of superior varieties and continuous expansion of the area of cultivation have also served an important function in raising unit area yield.

Since Liberation, our province experienced four rather large scale replacements of varieties. At the beginning of Liberation, better local varieties such as jin hua bai pu, li shui shan yue huang, lan xi zao wheat and lin hai luo yang qing were propagated. At the same time, introduced varieties such as nan da 2419, ai li duo and yu pi were planted. The variety nan da 2419 was planted over a larger area. In the mid-1950s and late 1950s systematically bred varieties which possessed a definite resistance to adversity and a better proliferate growth characteristic such as zhe nong 17, zhe nong 939, zhe nong No 9 and yi wu jie mai were propagated. Introduced varieties included a fu, a bo, and ai gan hong. After the mid-1960s, the above varieties were gradually replaced by huang mai No 1 and the ai luo yang which possessed better properties of surplus yield and definite resistance to adversity. In the mid-1970s, the zhe mai No 1 (908) which was a successfully bred hybrid that matures early and possesses a wide adaptability became the dominant variety. But at present in our province's northern and eastern regions, the maturation time of zhe mai No 1 was still not ideal enough. The broad poor-lower-and-middle peasants were urgently demanding for cultivation of a new variety of wheat that matures early and produces a high yield. Early maturity of wheat is still a problem which

must be considered in our province's breeding and cultivation work. Secondly, as agricultural techniques continuously improve, as the amount of fertilizers being used continuously increases, as unit area yield is raised year after year, the original wheat varieties that produce a medium level yield cannot satisfy the needs of the development of agricultural production. The urgent task in our province's wheat breeding and cultivation work has now become the cultivation and breeding of new short-stemmed or semi-short stemmed wheat varieties that are tolerant to fertilizers, resist lodging and are high yielding. Thirdly, our province's amount of rainfall is large and scab of wheat occurs yearly. During the growth period of wheat, especially during the periods of heading flowering and filling of wheat, there is an overabundance of rainfall, humidity is high, the temperatures are suitable for the spreading of diseases and scab of wheat occurs and causes damage. During the 25 years between 1955 and 1972, there were 11 years in which the plants were afflicted lightly, the percentage of diseased plants was between 10% and 20% and the loss in yield was below 10 percent. There were 9 years in which the plants were afflicted with medium severity, the percentage of diseased plants was between 30 percent and 50 percent and the loss in yield was between 10 percent and 20 percent. There were 5 years (1954, 1957, 1958, 1973, 1975) in which the plants were afflicted seriously, the percentage of diseased plants was above 50 percent and the loss in yield was between 20 percent and 50 percent. Scab of wheat has already become an important hindrance to stable yield of wheat in our province. Selective breeding of varieties resistant to scab is a condition for sustaining increased yield of wheat in our province.

In general, our province's wheat varieties lack backup strength and there are situations where temporary shortages and gaps occur. Therefore, selective breeding of new wheat varieties with good comprehensive properties and high yields has become the subject to be urgently solved.

(1) Goals of Breeding Varieties

The goals in breeding varieties must be to seek breakthroughs in early maturity, overcoming scab of wheat and achieving high yields and maintaining good quality. Efforts should be centered around selective breeding of a group of varieties suitable to the ecological conditions and production levels of the planting systems of triple cropping of rice, rice and wheat a year and double cropping of cotton and hemp in mountainous regions. In the triple cropping paddy rice regions of the north and the east, the time of maturation of wheat should be before May 20 and the per mu yield should be above 600 jin.

In the triple cropping paddy rice regions of the central and southern areas, the maturation time of wheat should be similar to that of the mai No 1 or slightly later and the per mu yield should be above 700 jin. In the mountainous regions of cotton and hemp crops, the wheat should be a variety of intermediate maturity or slightly early maturity and the per mu yield should be above 800 jin. At the same time, emphasis should be placed on the selective breeding of new varieties of wheat which are strongly resistant to cold and suitable for early sowing, require less fertilization, produce high yields and are suitable for planting in mountainous regions.

1. Selective breeding of early maturing varieties: The length of the growth period of wheat is related to the stages of growth. Wheat must grow in several stages from the time it is sown to maturity. The major stages are the thermostage and the photostage. Because the thermostage and the photostage often span a long time, reducing the sensitivity of varieties sensitive to the duration of light and to winter will shorten the duration of growth of these two stages and will generally bring about earlier maturation. Autumn sown wheat, generally speaking, is a spring crop in the south. Further north, its winter character strengthens, and the time needed to pass through the thermostage becomes longer. Reaction to the duration of light changes from slow to sensitive from south to north. The further north, the longer the duration of the photostage becomes. Similar spring varieties or varieties similarly slow in their reaction to the duration of light have varied degrees of reaction to and demands for temperature and light conditions. In selecting material for cultivation of hybrid early maturing varieties, special attention should be paid to the differences among varieties and materials which are not sensitive to both temperature and light.

The length of the growth period of wheat is also related to its phenological stage. The life of wheat passes through different growth stages. The corresponding series of organs and tissues constitutes each phenological stage. For example, when germination, tillering, jointing, heading, flowering, filling and maturation occur early, i.e., when each growth stage emerges early and when the duration of each is short, then the plant will mature early.

Whether it is growth by stages or a phenological stage, each stage cannot be separated from the characteristics of the varieties and from conditions of temperature and light. The growth period of a variety is a reflection of growth under definite ecological conditions. Therefore in the course of selective breeding early maturing varieties, ecological conditions must be taken into consideration.

In general, since the growth period of wheat is not a singular genetic characteristic but is the combination of many genetic characteristics, and since it is controlled by the minutely effective genes, it is rather difficult to make wheat mature earlier. At present, the actual situation in Zhejiang province must be joined to major efforts to select or to create by ourselves material which can head early under lower temperatures, flower early and fill and grow with no water (irrigation), and material whose heading and flowering times are close together. Those materials which have been preliminarily determined to possess good qualities of early maturity, fast filling and strong inheritance are tai he, lin pu zao, 908, 817, 809, Colonias, fu qing No 3, E70, da li zao and Anhui No 11. Our practical experience in cultivating early maturing varieties for many years indicate: (1) Early maturing varieties (lines) can be easily selected by hybridization using a variety from a low latitude and high elevation and which is not sensitive to temperatures and light as a parent. For example, the hybrid offspring of "xuan 16" which was selectively bred from (809 X Xolonias)

F₃ X E70 and yang mai No 3 X jin ai zao 21 matures 2 to 3 days earlier than zhe mai No 1 in Hangzhou. Again, for example, the Jiangsu Provincial Agricultural Science Academy successfully bred ning mai No 4 by crossing Yunnan 525 and Anhui 11. The maturity time was earlier than both parents and was 1 to 2 days earlier than zhe mai No 1. (2) In selecting and coupling parents, one of the parents should possess the characteristic of early maturity and the geographical distance of their origin must be far so that single plants that mature early can be produced in the second generation. In the past, we did not grasp hold of the major goals of breeding. In selecting and coupling parents, we used the province's superior intermediate or late maturing local varieties as the female and used the short-stemmed late maturing and surplus yielding varieties introduced from Italy as the male, and superior early maturing varieties could not be produced and selected. Later, early maturing varieties were coupled with early maturing varieties in selecting and coupling parents and in particular, parents from geographically distant origins were coupled as hybrid combinations. Lin pu zao tai he was used and as a result zhe mai No 1 variety was bred. Its early maturity is a standard domestically. (3) In crossing spring and winter varieties, the addition of spring factors brings about a wide range of separation after the F₂ generation and early maturing material can be selected from among these later generations.

In cultivating early maturing wheat varieties, the use of physiochemically induced variation and systematic selection and breeding to select early maturing varieties from early maturing varieties in addition to the method of breeding hybrids are also effective ways to achieve the goals. For example, the group for breeding varieties of wheat by radiation of our academy's atomic energy utilization research institute successfully bred "zhe fu ai" in 1970 by selectively breeding dry seeds of yang mai No 1 after subjecting them to 30,000 roentgens of radiation from Cobalt⁶⁰. It matures 2 to 3 days earlier than yang mai No 1. The Yangzhou Regional Agricultural Sciences Institute systematically and selectively bred the yang mai No 3 from yang mai No 1. It matures 4 to 5 days earlier than yang mai No 1.

But in the work of breeding early maturing varieties, our province's winter and spring temperatures are not stable enough. Especially in February, low temperature cold fronts easily occur. The early maturing varieties selectively bred should not possess an overly strong spring character, their jointing times should not occur earlier or overly early, otherwise they will be easily damaged by frost. For example, winter temperatures in 1977 remained persistently high and the varieties wen mai No 4 which had a strong spring character and early sown yang mai No 1 jointed early. On February 28 the next year, the temperature dropped to 3°C to 5°C below zero and the young spikes of wheat were severely damaged by frost. Again for example, between the end of January and the beginning of February of 1979, low temperature cold fronts occurred frequently and wheat suffered from frost. According to our survey conducted on February 8, the degree of frost damage to the leaves of spring varieties reached levels II and III. The number of small sterile flowers of the early maturing line "xuan 16" which was

sown at its proper time increased, its percentage of empty shells was high, its percentage of fruiting was low, and its yield was seriously affected. Leaves of semi-winter varieties such as zhe mai No 1 were slightly damaged by frost while the province's local varieties such as li shui shan yue huang, zao huang, xin chang zao wheat and winter varieties were not found to be damaged by frost.

The yield of ordinary early maturing varieties is often less than that of intermediate or late maturing varieties. In coupling combinations as parents, consideration must be given to supplementing each parent's young spike differentiation by the other. Differentiation during the early and the middle periods should be slow and differentiation during the latter period should be faster, thus not affecting or only slightly affecting the enlargement of the spikes and multiplication of the grains. Filling and growth without water (irrigation) should be fast so that speed can supplement for time.

2. Selective breeding of varieties resistant to scab of wheat: Scab is a regional disease in our province. Results of studies on the effectiveness of selection and genetic development of scab in later hybrid generations of wheat conducted by us and in our nation in recent years show that wheat's resistance to scab is believed to be inheritable, but it is controlled by the minutely effective multiple gene and is quantitative heredity: (1) The occurrence of disease among F_1 plants of hybrid combinations shows that most of these hybrids are intermediate types between the two parents. In 1979, we conducted a survey of the percentage of occurrence of disease and compiled an index of severity for 48 hybrid combinations and their F_1 plants. We discovered that a large majority of the hybrid combinations follows the above pattern. For example, the percentage of occurrence of disease of the females in 975 X E70 was 60 percent and the index of severity was 25. The percentage of occurrence of disease of the males was 100 percent and the index of severity was 70. The percentage of occurrence of disease among the F_1 plants was 75 percent and the index of severity was 36.25. Again for example, the percentage of occurrence of disease of the females of Yunnan 525 X wu mai No 1 was 100 percent and the index of severity was 65. The percentage of occurrence of disease of the males was 50 percent and the index of severity was 13.75. The percentage of occurrence of disease among the F_1 plants was 85 percent and the index of severity was 40 (under conditions of inoculations in the fields). (2) The range of variation among the F_2 plants of hybrid combinations is big, and the variations are continuous. (3) Plants possessing properties surpassing the parents emerged from the hybrid offspring of diseased varieties. The most obvious example was the su mai No 3 successfully bred by the Suzhou Regional Agricultural Science Institute. Its parents were a fu and Taiwan wheat which were both diseased varieties. But the hybrid offspring su mai No 3 showed properties surpassing the parents. (4) Continuous selection can produce disease resistant material from diseased varieties. For example, the wan nian No 2 which is rather resistant to scab was selected from the diseased variety nan da 2419 by the Jiangxi Provincial Agricultural Science Institute. The yang mai No 3 (zao hong

3-4-1) was selectively bred from the yang mai No 1 line by the Yangzhou Regional Agricultural Science Institute. Its resistance is better than that of yang mai No 1. (5) The degree of severity of scab disease of the varieties reacts very sensitively to environmental conditions. The disease becomes more severe when the amount of fungi is large and the weather conditions are appropriate, and less severe conversely. The above phenomena are all quantitative heredity.

Wheat's resistance to scab is also related to the morphological structure and growth stages. Results of determination by inoculation of 568 batches of material during the three years (1974-1976) conducted by the wheat disease group of the plant life protection research institute of our academy show that six varieties that are more resistant to disease are su mai No 3, su mai No 2, xin zhong zhang, Frontana, wu ming xi No 5, and wan nian No 2. The 8 varieties tolerant to the disease are zhong an ji No 4, yong feng No 1, ai gan hong 69-14, dong feng No 1, yang mai No 3, shang pa, you bao, 2075 xuan (1-2). All of these can be used as material for hybrid parents. At the same time it was observed that the wheat plants with a short flowering period and a concentrated flowering period suffered only slightly from the disease while those with longer periods and less concentrated periods suffered severely from the disease. For example, su mai No 3 had a flowering period of 4 days and its percentage of diseased plants was 72.36 percent. Jiu lan had a flowering period of 5 days and its percentage of diseased plants was 100 percent. Those plants having less remnant anther suffered lightly while those having more suffered severely. Tall plants with few small spikes growing on the spike suffered lightly and those not possessing such characteristics suffered severely. Plants which contracted the disease before flowering suffered lightly and those which contracted the disease during the flowering period suffered severely.

Because wheat's resistance (tolerance) to scab is a quantitative characteristic, it is better to breed plants with such resistance in the field. This means that when individual plants are selected from the hybrid offspring, selection of resistance should be conducted in the fields, i.e., to select resistant plants from among the resistant plants. In coupling combinations, the coupling should be resistant (tolerant) X resistant (tolerant). The number of resistant genes will gradually increase and the phenotype of resistant plants will gradually strengthen and material surpassing the parents can easily emerge from among the offspring. For example, the percentage of occurrence of disease of the F_1 plants of reaction type R⁺ of the combination xuan 209 X zhen 7495 which we produced was 25 percent and its index of severity was 6.25, less than the 50 percent of occurrence of disease of the xuan 209 parent of reaction type M-R and its index of severity of 23.75. Among materials of late generations, the reaction type of the offspring of jin zhou No 1 (M-R type 3 X xu mai No 3 (R type)) is also of reaction type R.

3. Selective breeding of short stemmed and strong stemmed high yielding varieties:

From the point of view of the potential for increased yields of wheat, emphasis should be on the structure for production, short stem and strong stem characteristics and plant type so that the conflict between high yield and lodging can be solved. The structure for production based on having sufficient spikes should include increases in the number of grains per spike and the weight of grains, and the selection of the productive strength of single plants. For example, in 1979, the Hangzhou City Agricultural Science Institute produced a per mu yield of 821 jin of zhe mai No 1 in a 1.82 mu plot. This was a record in the high surplus yield of wheat that surpassed the "guidelines" in one season. The number of spikes per mu reached 342,000, each spike had 35.8 grains and the thousand grain weight was 34.2 grams. In 1978, the Jiangsu Provincial Agricultural Science Academy produced a per mu yield of 1,137.9 jin of ning mai No 3, breaking the 1,000 jin per mu level of high surplus yield. The basic number of seedlings per mu was 125,500, there were 399,000 spikes and each spike had 39.87 grains. The thousand grain weight was 38.09 grams. The common characteristics of such high yields were a larger number of grains per spike and a heavier weight per thousand grains than yields of past years.

Using short stemmed high yielding varieties that are tolerant to fertilizers can rapidly raise the yield. The best known example abroad is Mexico. In our province, the varieties of the 1970s are shorter than the varieties of the 1950s and 1960s by 20 to 30 centimeters, and the economic coefficient has also been elevated greatly. For example, plants of zhe mai No 2 are only 80 centimeters tall. The seed grains constitute 40.5 percent of the weight of the whole plant. The plants are highly tolerant to fertilizers and highly resistant to lodging. But the shorter the stem may not always be the better since overly short plants have poor adaptability and easily become diseased. Therefore in recent years the trend has been to cultivate semi-short stemmed varieties. Only in this way can the conflict between surplus yield and shortness be coordinated. At present, it is not difficult to shorten the stems of wheat plants and there are more short stemmed material sources such as: nong ling No 10, non ling 89, shui yuan 86, a qi a yi, ai feng No 1, da mu zhi ai, 7026 line, NPFP line ao li sun, tai he and E70. As parents, their inheritance is strong.

Plant type is an important property of high yielding varieties. It is the key to raising productive potential. This seems even more important in our province because during the growth period of wheat, the weather is warm, it is damp and sunshine is scarce. The plant type must be clustered, the leaf must be narrow but firm, distribution of the leaves must be logical, the boot leaf must be erect, and the leaves' functional period must be long to fully utilize energy from the sun. There are only a few materials with good plant types. According to present understanding, the better varieties are: zao 5, xiang yang No 4, wan zai zao No 1, and the xiao yan line.

92) Gaps Existing in the Work of Breeding of Wheat and Links to be Strengthened in the Future:

According to our province's goal of cultivating varieties of wheat, the major gap in the present work in cultivation of wheat varieties is the small source of varieties and the study is not thorough enough. The scale of

cultivating varieties is small and the cycle for successfully cultivating a new variety is long. The study of basic theory is still not carried out very well. The study and application of new techniques are weak. The comprehensive properties of varieties which have been cultivated cannot satisfy the needs of production. In the future, emphasis should be placed on the study of the following in the work of cultivating varieties:

1. Localized cultivation of varieties in regions according to the agricultural zones in our province should be carried out to save time and to avoid repetition.

2. The collection, study and creation of sources of varieties in the work on primary source material should be greatly strengthened to understand the major economic properties and genetic characteristics. It is best if a specialized agency can be established.

3. Coupling of combinations should be done so that quantity can guarantee quality. In view of our province's present situation in cultivation of varieties of wheat, the combinations put together each year must not be too few. In principle and according to manpower, and land of each unit, quantity should assure quality. In the treatment and selection of hybrid offspring, generally elimination should not be done in the F_1 generation and consideration may also be given to elimination of combinations with major properties not surpassing those of the parents when necessary. Generally between 3,000 and 5,000 plants should be planted for the F_2 generation. At present, the number of plants are too few. Combinations should be selected first and individual plants should be selected later. Yield of F_3 is closely related to the yield of later generations, thus F_3 plants can be drilled for early forecast of yield.

4. Emphasis should be placed on conditions of cultivation and directive selection. Cultivation and stability of the experimental land for cultivation of varieties should be regarded seriously. These considerations and cultivation and management of the experimental land timely, evenly and carefully are basic conditions for the cultivation of superior varieties.

5. The means and methods used in the progress of cultivation of varieties should be further explored and hastened. Conditions which will shorten the number of years for cultivation of varieties should be actively created. Cultivation of wheat varieties should be armed with modern scientific research methods and means.

6. Work should be carried out by launching coordinate efforts of many disciplines. Special disciplines concerned with physiology, pathology and agricultural chemistry must direct their efforts around the goals of cultivation of varieties and conduct studies with concentrated effort so that the results will be outstanding.

7. Propagation of superior varieties must be done well to realize standardization of superior varieties.

I personally believe as long as efforts are made in the several directions mentioned above in the work of cultivating varieties will surely be done well and greater contributions can be made in the new long march towards realizing socialist agricultural modernization.

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BRIEFS

SHEEPSKIN PROCUREMENT--Zhejiang Province procured 1.31 million sheepskins and 1.47 million jin of rabbit fur in 1979, topping the previous year by 567,000 skins and 476,000 jin respectively. Exports of the two items earned more than 30 million dollars in foreign exchange. [OW051017 Hangzhou Zhejiang Provincial Service in Mandarin 0400 GMT 4 Feb 80 OW]

YOUTH AFFORESTATION DRIVE--The Zhejiang Provincial CYL Committee and the provincial forest bureau recently held a provincial youth afforestation meeting in Tiantai County. Yuan Fanglie, standing committee member of the provincial CCP Committee and vice provincial governor, addressed the meeting. Comrade (Wang Hengjin), secretary of the provincial CCP Committee, delivered a report. ZHEJIANG RIBAO published a commentator's article on 15 February calling for a provincial afforestation drive. The article reveals Zhejiang plans to afforest 2 million mu of land and plant 50 million trees around houses and villages and along roadsides and rivers. It calls on all youths to help realize this goal. It also calls for enforcement of the policy that whoever plants trees will have ownership rights. [Hangzhou Zhejiang Provincial Service in Mandarin 0400 GMT 15 Feb 80 OW]

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Agricultural Sciences

MOLECULAR BASIS OF REMOTE HYBRIDIZATION - AN EVIDENCE OF THE HYPOTHESIS THAT DNA SEGMENTS OF DISTANTLY RELATED PLANTS MAY BE HYBRIDIZED

Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 4, Dec 79 pp 403-413

Zhou Guangyu [0719 0342 1342], Gong Zhenzhen [7895 5550 5550], Wang Zifen [3769 5261 0118], Shanghai Institute of Biochemistry, Chinese Academy of Sciences

[Abstract] During the last 20 years in Chinese agricultural research, the method of ordinary pollination has been used to produce many stabilized hybrids (such as hybrids of Rice X Sorghum or Rice X Maize, etc.) containing chromosomes which are not different from their mother plants by light microscopy. Their phenotypes are in general essentially those of their female species. However, in appearance and certain other characters such as resistance to insects and to disease and drought, productivity, spike size, shape, colour etc., they may show many alterations. Such changed characters are inherited and have been kept stable for at least ten generations. After extensive investigation, it seems that this phenomenon of hybridization between distantly related plants

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[continuation of YICHUAN XUEBAO No 4, Dec 79 pp 403-413]

could not be explained simply by spontaneous mutation or segregation of the genetic impurities of the maternal plants. Instead, during hybridization there might have been some combination with foreign genetic material, probably segments of DNA from the pollen containing structural or regulatory genes or broken pieces which had already lost their original genetic function. They might have been integrated into the ovarian genome, bringing about changes in the maternal structural genes or their mode of expression, and then afterwards, certain of the characters of the crossbreed also changed. Since the structure and function of the chromosomes of distantly related plants, as a whole, are quite different, they may often be completely reciprocally exclusive, but from an evolutionary point of view, a certain portion of DNA or certain individual genes may show more or less affinity, thus rendering them capable of recombination. To prove this hypothesis, we have chosen the F₁₂₋₁₃ hybrids of Rice X Sorghum made by the Crop Breeding and Culture Institute, Chinese Academy of Agricultural Sciences, to investigate the possible changes in the isozymes composition of the hybrids. Those hybrids which had been stabilized and shown differences in the spikes, were selected from the offsprings of a single original hybridized grain. We used 34 of them for esterase isozyme analysis,

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laying special emphasis on No. 77125. The chromosomes of No. 77125 have been extensively examined and shown to be the same as those of the maternal plant (Yinfang) under the light microscope. But No. 77125 is very tall (nearly 2 m) and bears a stout stem (more than 1 cm in diameter) large spikes and full grains (Fig. 1). In its esterase electrophoretogram a new band (No. II) was found which is identical in electrophoretic behaviors in the one of the sorghum (Hengjiali) bands (Fig. 2.), but absent in the electrophoretogram of the maternal plant. The No. II band was found to be present in No. 77125 in all stages of development and in all parts of the plant. The mother plant has never revealed the No. II band. In sorghum this band was present only in immature and mature seeds as well as in the first three days during germination.

Among 140 different species of sorghum, more than 80 percent have the No. II band of No. 77125. It seems that this band is one of the common characteristic bands of sorghum.

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In 34 hybrids (including No. 77125) we examined, eleven have the No. II band. It seems that not all of the hybrids could preserve this isozyme. We examined 180 different species of rice of which 16 percent retained the No. II band. It is thus not a common characteristic band of rice, but it has shown certain affinity with rice. In our hypothesis of DNA segment hybridization it is suggested that in distantly related plants the chromosomes as a whole may generally be reciprocally exclusive. But some DNA segments showing sufficient affinity might be hybridized occasionally to the maternal genome. The appearance of No. II esterase isozyme in No. 77125 Hybrid may be an evidence for the transference of a structural gene from sorghum to rice. Alternatively, a regulatory effect from DNA segments of sorghum might have stimulated a "silent gene" of rice to activity. We are inclined to take the former as the first possibility, but at the moment, the latter cannot be ruled out.

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**DIVERSITY, SPECIFIC PERFORMANCE OF PROGENIES FROM DISTANT HYBRIDIZATION
BETWEEN RICE, SORGHUM**

Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 4, Dec 79
pp 414-420

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[Abstract] Hybrids were obtained from sexual crosses of rice and sorghum, among them the outstanding one was derived by crossing rice variety Yinfang as female parent with the sorghum Hegari (common name) as male parent. The F_1 hybrid plant in potting grows vigorously but much delay in development, it did not head until October. It was then removed into the greenhouse for continuous growing; it blooms but does not bear any seed. The stubble was removed out of doors in the following spring, and it heads again later. The panicles of the
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F_1 plant are large with numerous flowers, but highly sterile. A small number of shrunken seeds are obtained from the F_1 plant. Wide and obvious variations occur in the 26 F_2 plants. Most of them are highly sterile too, and seeds obtained showing not well develop d. The same aberrant characters are retained in the subsequent generations.

Hybrid plant (F_1) resembles rice in appearance. However, segregation takes place crazily since F_2 . For instance, the number of days to maturity varies from 130 to more than 200. Plant height ranges from 60 cm to about 2 m. The variance of panicle shape is very striking with many different types not quite discernible. Some of panicles are very much like those of sorghum as shown in the erecting cylindric shape, and the contracted ones. The rachis and rachlets of the latter are densely covered with grains. There are also effuse types with thin rachlets and scattered grains. The length of panicle ranges from 10 to more than 30 cm. Most lines have large panicles with numerous grains; some of the main panicles bear 500-600 grains. 1000-grain weight ranges from 15 to more than 30 g, the uppermost reaching 41 g. Grain shape varies from round to long-elliptic. Glume color varies notably in stramineous, brown,
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reddish brown, purple, and some with purple spots. Moreover, other characteristic features have often been observed on the progenies in the early generations. For examples, some with big bracteal leaf wrapping about the panicle, some with aerial roots on the upper nodes of the stem, some with stout stems about 10 mm in diameter, and others with enormous leaf blades, the maximum leaf length up to 70 cm, and breadth up to 30 mm. Besides, a few lines sprouting nodal tillers from most of the stem nodes have been found.

In respect to the physiological character, the drought endurance of a good few lines is strong enough to cope with upland rice.

In spite of the lack of cytological study in the early generations, a small number of cells from several F₈ lines have been observed. Changes of chromosome number and chromosome behavior are found in both of the pollen mother cells and root tip cells. However, no abnormal phenomenon has been observed in the cells from F₁₃ of the same lines.

Some of the F₁₂ and F₁₃ lines were taken by comrade Zhou Guangye (Shanghai Institute of Biochemistry, Chinese Academy of Sciences) for isoenzyme study. One more band appearing in the electrophoretic pattern of esterase among some lines was observed that seems to have come from the male parent sorghum.

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A PRELIMINARY STUDY ON THE RECEIPT OF PURE LINE OF MAIZE BY MEANS OF ANTHER CULTURE IN VITRO

Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 4, Dec 79 pp 421-426

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[Abstract] In March and August, 1978, we achieved two self-pollinated and fruitful pure diploids by anther culture in vitro, amounting to 115 seeds. Seeds from first plant was sown in May in field for observation of progenies with their parents. In February and March 1979, we achieved five self-pollinated and fruitful plants five self-pollinated plants between lines, and one cross-pollinated plant.

Experiment proves that the second generation (H₂) of plants from anther culture in vitro are almost similar. We have received 47 pure lines, and at the same time determined the crossing ability of them. A comparison of genetic characteristics has also been made between the progenies and their parents.

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INFLUENCE OF MEDIUM ON DIVISION OF CELLS REGENERATED FROM MESOPHYLL PROTOPLAST
OF TOBACCO AND REGENERATION OF PLANT

Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 4, Dec 79 pp 427-433

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[Abstract] Protoplast, isolated from mesophyll cells of tobacco (*Nicotiana tabacum* var. Copus yeusuheku No. 4) through a "one-step procedure" with the enzyme made in China, was cultured by means of liquid-thin-layer culture. About fourteen days later, the medium was supplemented with fresh liquid in the absence of mannitol, so as to decrease the osmotic pressure to half of the original level. Then, protoplast was transferred to a solid medium without mannitol. The small callus, 1-2 mm in diameter, was transferred to the differentiation medium for regeneration of the intact plant. The plantlet was transferred to a pot to grow.

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Comparisons of various components of media were carried out. It was shown that a little change of the content of two macroelements and the increase of lactalbumin hydrolysate and certain organic substances, would accelerate the cell division and increase the frequency from about 50 percent in NT medium as control, up to more than 80 percent. Budding and the effect of the condition on culture were discussed.

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